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ABSTRACT

Many colleges and universities provide grant aid to undergraduates to help them pay for all or part of the tuition and fees charged by the institution. This study provides information about recent trends in institutional aid receipt and then examines the relationship between such aid and the likelihood of recipients staying enrolled in the awarding institution relative to comparable unaided students. The trend analysis is based on data gathered from three administrations of the National Postsecondary Student Aid Study conducted in 1992-1993, 1995-1996, and 1999-2000. The retention analysis is based on data from the first and second followups to the 1995-1996 Beginning Postsecondary Students Longitudinal Study (BHPS:96/01). BPS followed a cohort of students who first entered college in 1995-1996 and were last surveyed in 2001. As was consistent with earlier studies, this study found that the percentage of full-time undergraduates in 4-year colleges and universities who received institutional aid increased over the last decade in the public and private not-for-profit sectors. In 1992-1993, 17% of undergraduates in public institutions received institutional aid, averaging about $2,200. By 1999-2000, 23% received such aid, averaging about $2,700. Much of the increase was in the form of aid based entirely on merit. In public institutions, a relationship between the likelihood of receiving institutional merit aid and family income could not be detected in public institutions. Some groups of students who received institutional grant aid in their first year were more likely than their unaided counterparts to re-enroll in their second year, but these findings differed by student group and sector. An association between institutional grant aid receipt in the first year and 6-year institutional retention or degree attainment was only evident among students in public institutions. (Contains 10 tables, 11 figures, and 16 references.) (SLD)

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# What Colleges Contribute

## Institutional Aid to Full-Time Undergraduates Attending 4-Year Colleges and Universities

## Postsecondary Education Descriptive Analysis Reports

**U.S. Department of Education**
Institute of Education Sciences
NCES 2003–157

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## Postsecondary Education Descriptive Analysis Reports

April 2003

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# Executive Summary

## Introduction

Many colleges and universities, both public and private, provide grant aid to undergraduates to help them pay for all or part of the tuition and fees charged by the institution. This practice, often referred to as "tuition discounting," has grown rapidly in recent years (Redd 2000; Cunningham et al. 2001; Hubbell and Lapovsky 2002). Depending on the type and selectivity of the institution, institutional aid is awarded for different reasons. Some institutions aim to promote access to low-income and otherwise disadvantaged students, others use institutional aid to increase the enrollment of meritorious students, and still others use it to increase tuition revenues (Allan 1999; Redd 2000). Many institutions are trying to accomplish more than one of these goals simultaneously (Redd 2000). Through the packaging of need-based and merit-based aid, different institutions use different strategies. For example, a need-within-merit strategy uses merit criteria, but prioritizes the recipients on the basis of need, whereas a merit-within-need strategy awards aid on the basis of need, but prioritizes the recipients on the basis of merit.

This study provides information about recent trends in institutional aid receipt and then examines the relationship between such aid and the likelihood of recipients staying enrolled in the awarding institution relative to comparable unaided students. The trend analysis is based on data gathered from three administrations of the National Postsecondary Student Aid Study, conducted in 1992–93, 1995–96, and 1999–2000 (NPSAS:93, NPSAS:96, and NPSAS:2000), and the retention analysis is based on data from the first and second follow-ups to the 1995–96 Beginning Postsecondary Students Longitudinal Study (BPS:96/01). BPS followed a cohort of students who first enrolled in college in 1995–96 and were last surveyed in 2001, about 6 years after their initial enrollment. Only full-time students attending 4-year public and private not-for-profit institutions were included in these analyses.

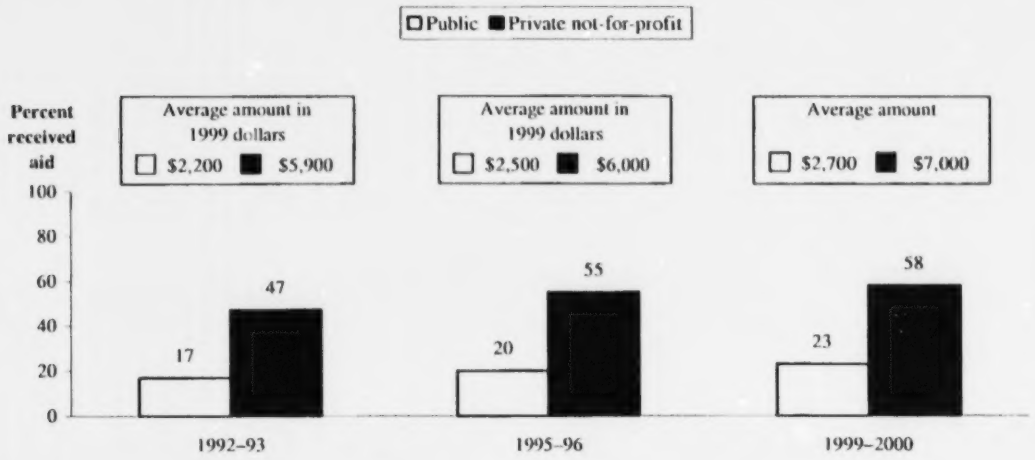
## Trends in Institutional Aid: 1992–93 to 1999–2000

Consistent with earlier studies reporting large increases in spending on institutional aid by 4-year colleges and universities (e.g., Cunningham et al. 2001), this study found that the percentage of full-time undergraduates in 4-year colleges and universities who received institutional aid increased over the last decade, both in the public and private not-for-profit sectors (figure A).[1] In 1992–93, 17 percent of undergraduates in public institutions received institutional aid, averaging about $2,200 (after adjusting for inflation to 1999 dollars). By 1999–2000, 23 percent received such aid, averaging about $2,700. In private not-for-profit institutions, 47 percent received institutional aid, averaging about $5,900 in 1992–93, while 58 percent did so in 1999–2000, averaging about $7,000.

Over the same period, there was a notable increase in the percentage of undergraduates in the

[1] Institutional aid includes both need-based and merit-based aid.

**Figure A. Percentage of full-time undergraduates enrolled in 4-year institutions who received institutional aid and among recipients, the average amount received in constant 1999 dollars, by institution control: 1992–93, 1995–96, and 1999–2000**




SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93, 1995–96, and 1999–2000 National Postsecondary Student Aid Study (NPSAS:93/96/2000).

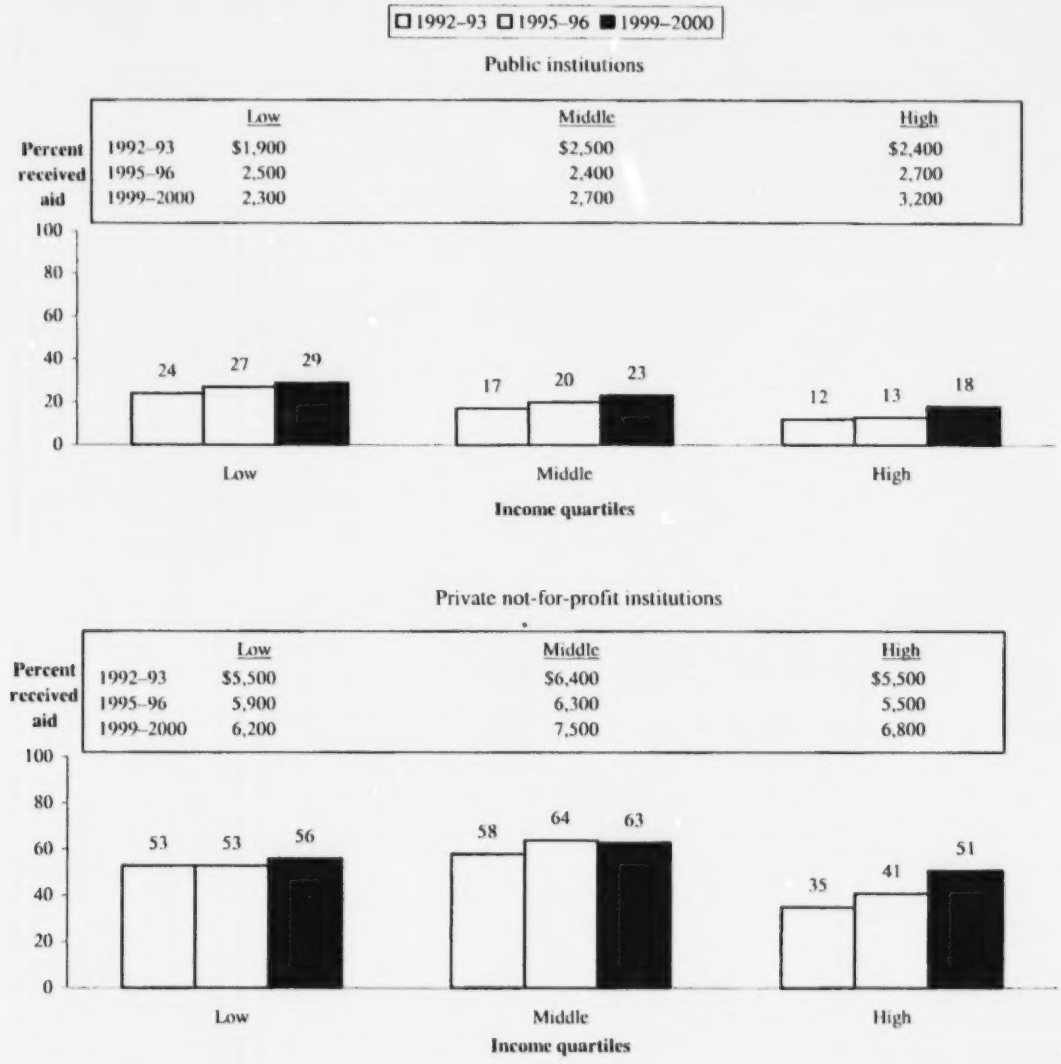
highest income quartile who received institutional aid, especially between 1995–96 and 1999–2000 (figure B). In private not-for-profit institutions, the percentage of undergraduates in the highest income quartile who received institutional aid increased from 41 to 51 percent between 1995–96 and 1999–2000. In public institutions the percentage of high-income students receiving such aid increased from 13 to 18 percent. In contrast, in both the public and private sectors, no corresponding increase was observed during that time for those in the lowest income quartiles; and in private institutions, no increase was observed for middle-income students.

Much of the increase in institutional grant aid awarded between 1995–96 and 1999–2000 was in the form of aid based entirely on merit.[2] The percentage of full-time undergraduates who received merit aid increased from 7 to 10 percent in public institutions and from 21 to 29 percent in private not-for-profit institutions (figure C). In contrast, between 1992–93 and 1995–96, no differences in the percentages of undergraduates receiving merit aid were observed in either public institutions or private not-for-profit institutions.

A relationship between the likelihood of receiving institutional merit aid and family income could not be detected in public institutions. That is, in all three NPSAS survey years, no differences were observed in the percentages of full-time undergraduates who received institutional merit aid among low-, middle-, or high-income students. In private not-for-profit institutions, on the other hand, differences by income were evident (figure D). In both 1992–93 and 1995–96, undergraduates in the middle-income quartiles were more likely than students in either the highest or lowest income

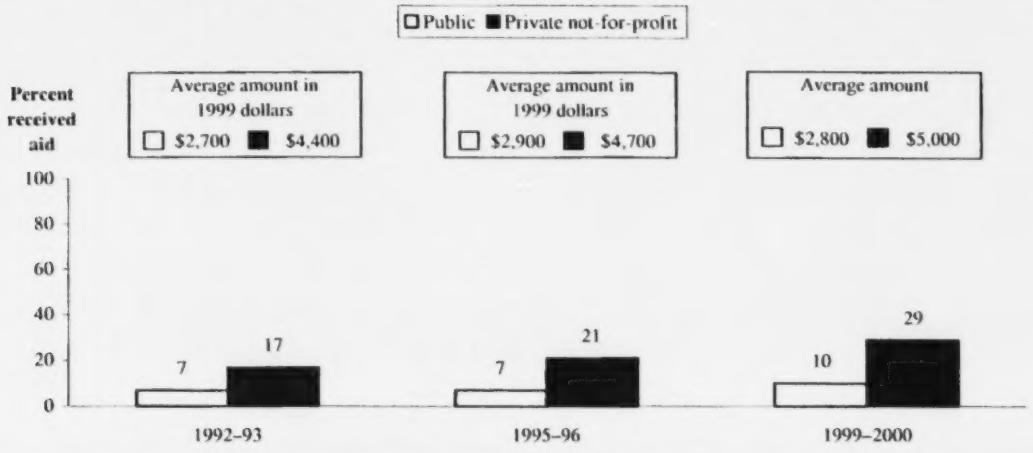
[2]In addition to academic scholarships, merit aid includes athletic and other merit scholarships. Merit aid is included in the total aid awards previously discussed and shown in figure B.

**Figure B. Percentage of full-time undergraduates enrolled in 4-year institutions who received institutional aid and among recipients, the average amount received in constant 1999 dollars, by income quartile: 1992–93, 1995–96, and 1999–2000**



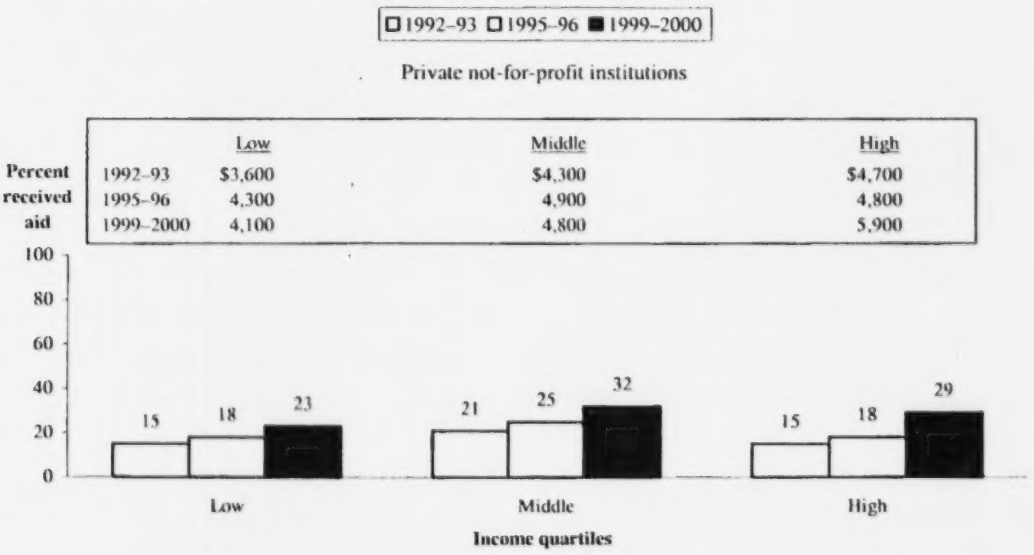

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93, 1995–96, and 1999–2000 National Postsecondary Student Aid Study (NPSAS:93/96/2000).

**Figure C. Percentage of full-time undergraduates enrolled in 4-year institutions who received merit-based institutional aid and among recipients, the average amount received in constant 1999 dollars, by institution control: 1992–93, 1995–96, and 1999–2000**




SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93, 1995–96, and 1999–2000 National Postsecondary Student Aid Study (NPSAS:93/96/2000).

**Figure D. Percentage of full-time undergraduates enrolled in private not-for-profit 4-year institutions who received merit-based institutional aid and among recipients, the average amount received in constant 1999 dollars, by income quartile: 1992–93, 1995–96, and 1999–2000**

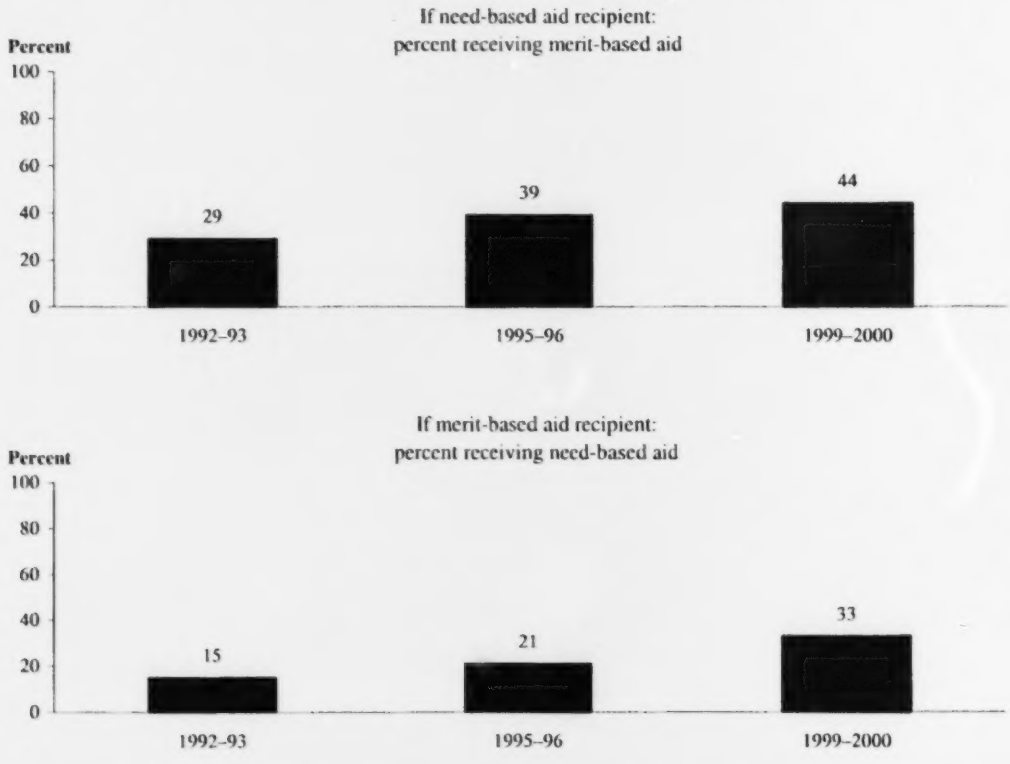



SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93, 1995–96, and 1999–2000 National Postsecondary Student Aid Study (NPSAS:93/96/2000).

quartiles to receive merit aid. By 1999–2000, however, no difference could be detected between the percentages of middle- and high-income students receiving merit aid (roughly 30 percent in each group did so), and students in both these income groups were more likely than low-income students (23 percent) to receive such aid. In other words, in private not-for-profit institutions, in the early to mid-1990s, middle-income students appeared to be favored over both high-income and low-income students in terms of receiving institutional merit aid. Institutions might award institutional aid in such a manner because low-income students are more eligible for need-based aid and high-income students have more discretionary income. However, by 1999–2000, no difference could be detected between those in the middle- and high-income quartiles, and students in both income groups were more likely to receive merit aid than their low-income peers.

As shown in figure E, need-based and merit-based institutional aid awards are often packaged together. In private not-for-profit institutions, where merit aid is most likely to be awarded, among full-time undergraduates, 44 percent of those who received need-based aid in 1999–2000 also received merit-based aid; among students who

**Figure E. Among full-time undergraduates in private not-for-profit 4-year institutions who received institutional aid, the percentage of need-based aid recipients who also received merit-based aid and the percentage of merit-based aid recipients who also received need-based aid: 1992–93, 1995–96, and 1999–2000**




SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93, 1995–96, and 1999–2000 National Postsecondary Student Aid Study (NPSAS:93/96/2000).

received merit-based aid, about one-third also received need-based aid. Taking into account the various need-within-merit and merit-within-need award strategies that institutions might use to increase institutional aid across income levels, if the trend in increased aid was aimed at all students, the notable increase in merit aid awards to high-income students in private not-for-profit institutions that occurred between 1995–96 and 1999–2000 would have been accompanied by a corresponding increase in total aid to low-income and most middle-income students, who are eligible for need-based aid. However, as is shown in figure B, this does not appear to be the case. Looking at total institutional aid, which includes both need and merit aid, no increase was observed in the percentage of either low- or middle-income students receiving aid between 1995–96 and 1999–2000, while awards to high-income students increased from 41 to 51 percent.

## Academic Merit, Financial Need, and Institutional Grant Aid Among First-Year Students

Among undergraduates who enrolled in a 4-year college or university for the first time in 1995–96, about 38 percent of full-time students received institutional grant aid, including about one-quarter (24 percent) in public institutions and nearly two-thirds (62 percent) in private not-for-profit institutions.

Institutional aid can be awarded on the basis of financial need, academic merit, or both need and merit. In addition, depending on the selectivity of the institution, institutional aid packages and amounts may vary. Therefore, in this analysis, students' high school academic merit,[3] their financial need,[4] and the selectivity of institutions[5] were taken into account when examining patterns of receipt of institutional grant aid.

Many of the differences observed in institutional grant aid awards were related to the selectivity of the institution. For example, in both public and private not-for-profit institutions, the likelihood of awarding institutional aid in very selective institutions did not vary significantly with students' academic merit, whereas in less selective institutions, it did. In less selective institutions, as students' high school academic merit increased, so did their likelihood of receiving institutional grant aid.

Differences by institution selectivity were also evident when examining the relationship between institutional aid awards and students' financial need, especially in the private sector. In very selective private not-for-profit institutions, as students' financial need rose, so did their likelihood of receiving institutional grant aid, from 21 percent of those with low financial need, to 59 percent with moderate need, to 66 percent with high need. In less selective institutions, on the other hand, while there was an association between institutional aid awards and financial need, fully one-half (51 percent) of students with low financial need received institutional grant aid, as did 71 percent of both those with moderate and high need.

[3]Levels of academic merit were based on an index incorporating three academic measures: college entrance exam scores, degree of high school curriculum difficulty, and high school grade-point average (GPA).

[4]Levels of financial need were based on the student budget reported by the institution (which includes the cost of tuition, books, and transportation, plus living expenses) after subtracting the expected family contribution (EFC) and government grant aid (both federal and state). This is the amount that institutions typically take into account before committing their own funds. This definition differs from the federal need definition, which is student budget minus EFC.

[5]Institution selectivity was based on the SAT or equivalent ACT scores of entering students. Institutions where at least 75 percent of entering students scored above 1000 on the SAT were considered "very selective." All others were identified as "less selective." (See appendix A for detailed descriptions of variables.)

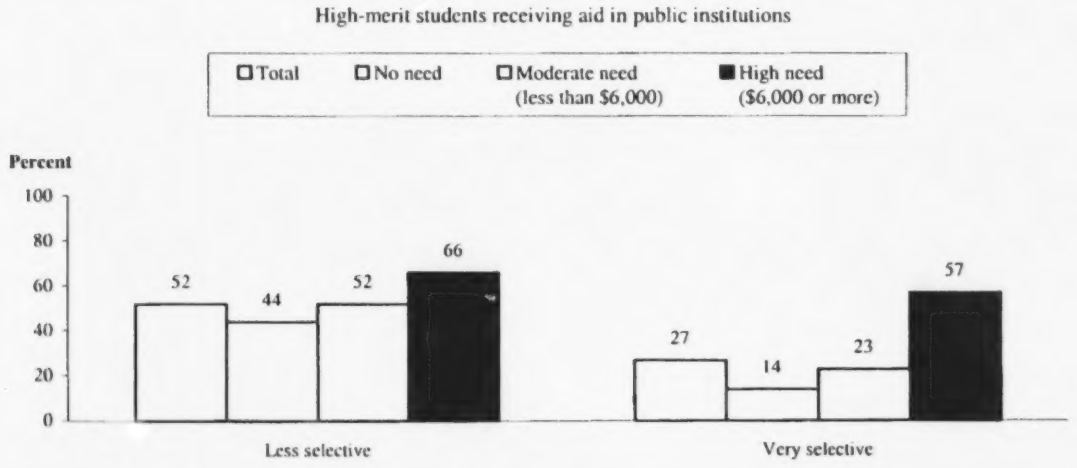
In both less selective and very selective public institutions, students' likelihood of receiving institutional grant aid was clearly associated with their financial need. Students with no financial need were less likely to receive institutional grant aid than their counterparts with high need. However, students with no financial need were more likely to receive institutional grant aid in less selective institutions than in very selective institutions, whereas those with high need were more likely to receive aid in very selective institutions.

When looking at students' financial need in relation to their high school academic merit, positive associations between students' financial need and the likelihood of receiving institutional aid awards remained for those who had achieved no higher than moderate levels of high school academic merit. This was observed for all institution types, including less selective private not-for-profit institutions: at such institutions, among those who had achieved moderate levels of academic merit, 69 percent with high need received institutional grant aid, compared with 47 percent with low need. However, as discussed below, for students who had achieved high levels of academic merit, whether or not they received institutional grant aid in less selective institutions did not vary significantly with their financial need.

### *Students With High Academic Merit*

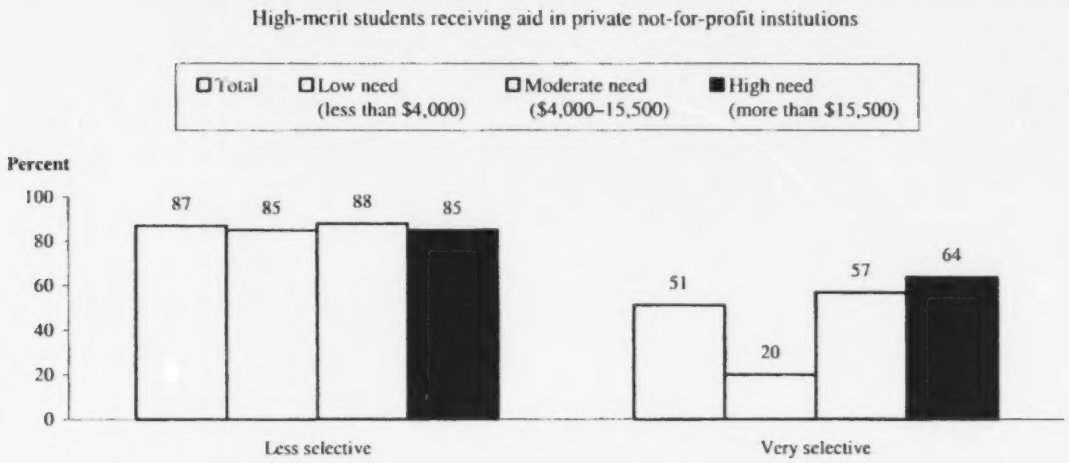
As shown in figures F and G, students enrolled in less selective institutions who had achieved high academic merit in high school were more likely to receive institutional grant aid than their high-merit counterparts in very selective institutions. This was observed for both public institutions (52 vs. 27 percent) (figure F) and private not-for-profit institutions (87 vs. 51 percent) (figure G). However, in less selective institutions, no

**Figure F. Among 1995–96 beginning full-time students enrolled in public 4-year institutions who had achieved high academic merit in high school, the percentage receiving institutional grant aid, by institution selectivity and financial need**




SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/98 Beginning Postsecondary Students Longitudinal Study, "First Follow-up" (BPS:96/98).

**Figure G. Among 1995–96 beginning full-time students enrolled in private not-for-profit 4-year institutions who had achieved high academic merit in high school, the percentage receiving institutional grant aid, by institution selectivity and financial need**




SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/98 Beginning Postsecondary Students Longitudinal Study, "First Follow-up" (BPS:96/98).

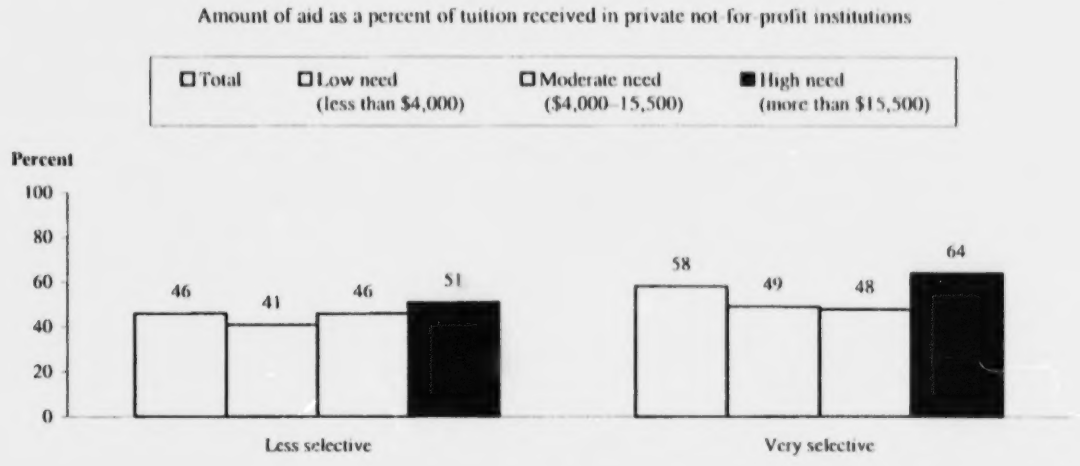
association could be detected between the likelihood of high-merit students receiving institutional grant aid and their financial need.[6] In private not-for profit less selective institutions, for example, roughly 9-in-10 high-merit students received institutional grant aid regardless of their financial need (figure G). In very selective institutions, on the other hand, high-merit students with high financial need were more likely to receive institutional aid than their counterparts with low (or no) need.

For high-merit students who received institutional grant aid, the average amount received as a percentage of tuition varied by institution selectivity in private not-for-profit institutions (figure H): those in very selective institutions received about 58 percent of their tuition amounts, compared with 46 percent in less selective institutions. However, in the same sector, only in very selective institutions did the amount of institutional aid received vary by aid recipients' financial need. Specifically, in very selective institutions, high-merit recipients with high financial need received enough institutional grant aid to pay for about two-thirds of their tuition, compared with about one-half of tuition for high-merit recipients with moderate or low need. In less selective private not-for-profit institutions, on the other hand, no difference in the average amounts received by high-merit recipients could be detected among students in terms of their financial need.[7]

[6]In public less selective institutions, the difference between the percentages of students with no need and high need who received institutional grant aid appeared to be different (44 vs. 66 percent), but because of large standard errors for high-merit students with high need, there was not enough statistical evidence to confirm the difference.

[7]The aid amounts for high-merit students with high need and low need appear to be different (51 vs. 41 percent of tuition), but there was not enough statistical evidence to confirm the difference.

**Figure H. Among 1995–96 beginning full-time students enrolled in private not-for-profit 4-year institutions who had achieved high academic merit in high school and had received institutional grant aid, the average amount received as a percent of tuition, by institution selectivity and financial need**




SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/98 Beginning Postsecondary Students Longitudinal Study, "First Follow-up" (BPS:96/98).

Tuition in public institutions is typically much lower than it is in comparable private not-for-profit institutions. Due to large variations in the amounts received, in particular for students with no financial need, statistical differences in aid amounts could be detected only for high-merit aid recipients in less selective public institutions. Among such students, those with high need received enough aid to pay 96 percent of their tuition, compared with recipients with moderate need who received only enough aid to pay 64 percent of their tuition.

## Institutional Grant Aid and Retention at Awarding Institution

How did the award of institutional grant aid relate to students' likelihood of staying enrolled in the awarding institution? The analysis addressed this question at two different points in time, 1 year and 6 years after students first enrolled.

### *One Year Later*

Some groups of students who received institutional grant aid in their first year were more likely than their unaided counterparts to re-enroll in their second year and less likely to transfer to another institution. But findings differed by sector and selectivity of institutions. In particular, differences in 1-year retention rates were observed for middle-merit students in less selective institutions, both public and private not-for-profit. Specifically, among middle-merit students, 87 percent of aided students in less selective public institutions returned in their second year, compared with 75 percent of unaided students; similarly, in less selective private not-for-profit institutions, 87 percent of aided students returned, compared with 70 percent of unaided students. A difference was also observed for high-merit students in very selective public institutions, where 97 percent of aided students returned, compared with 90 percent

of unaided students. Due in part to small sample sizes and uniformly high retention rates, 1-year retention rate differences could not be detected for any merit group in very selective private not-for-profit institutions.[8]

### *Six Years Later*

Six years after their first enrollment, differences between aided and unaided students were only observed in public institutions. Students who had been awarded institutional grant aid in their first year were more likely than their unaided counterparts to have either attained a degree from or still be enrolled at the awarding institution.[9] In less selective public institutions, this trend was found across all merit groups, while in very selective public institutions, a difference in retention between aided and unaided students was detected only for high-merit students (88 percent of aided students maintained their enrollment vs. 78 percent of unaided students).

In private not-for-profit institutions, whether they were less selective or very selective institutions, no differences could be detected between the 6-year retention rates of students who received institutional grant aid in their first year and those who did not.

These results held in a subsequent multivariate analysis after taking into account students' academic merit and financial need, the selectivity of institutions, and a number of other variables related to retention.[10] Full-time undergraduates who received institutional grant aid in public institutions were more likely than their unaided counterparts to earn a degree from or still be enrolled at the awarding institution 6 years after they had first enrolled. However, the same pattern was not observed for those enrolled in private not-for-profit institutions. While it appears as though receiving high amounts of institutional grant aid in private not-for-profit institutions (covering 75 percent or more of tuition) was associated with higher retention, there was not enough statistical evidence to confirm a difference once the multivariate analysis was applied.

## Conclusions

This study found that the percentage of full-time students receiving institutional grant aid increased measurably between the early and late 1990s. Increases in aid were especially apparent for students in the highest income quartile, and much of the increase was awarded in the form of merit aid.

The study also found that students who achieved high academic merit in high school were more likely to receive institutional grant aid if they attended less selective rather than very selective institutions (in both the public and private not-for-profit sectors). However, an association between high-merit students receiving such aid and their financial need was not readily apparent in less selective private not-for-profit institutions, whereas in very selective institutions (both public and private not-for-profit), the likelihood of high-merit

[8]For example, 88 percent of high-merit aided students in very selective private not-for-profit institutions were still enrolled, as were 81 percent of comparable unaided students, a difference that is not statistically significant.

[9]Institutional grant aid receipt was only known for the first year of enrollment. The relationship discussed here is whether students received institutional aid in their first year and then persisted in the awarding institution for 6 years.

[10]While the analysis controlled for observable student characteristics that might be related to persistence, it is possible that unobservable characteristics are related both to the receipt of institutional aid and persistence. For example, an institution might be more likely to give aid to students it perceives as more likely to succeed over students with comparable merit and need.

students receiving institutional grant aid increased with their financial need.

There was evidence that receiving institutional grant aid as freshmen was related to higher 1-year retention rates for certain groups of students, namely, those who had achieved moderate levels of academic merit and had enrolled in less selective institutions (both public and private not-for-profit), as well as those who had achieved high academic merit and enrolled in very selective public institutions. However, an association between institutional grant aid receipt in the first year and ó-year institutional retention (or degree attainment) was only evident among students in public institutions.

Taken together, the results are consistent with those of other studies reporting higher spending by 4-year colleges and universities on institutional aid (e.g., Cunningham et al. 2001), especially by less selective private institutions (Redd 2000; and Hubbell and Lapovsky 2002). Also, as discussed in Duffy and Goldberg (1998), the findings revealed that in the late 1990s, the percentage of high-income students receiving institutional grant aid (in particular merit aid) increased, as did the average amount they received. This study could not address whether institutional grant aid awards had increased the enrollment of the types of students that institutions sought. However, the findings did indicate that in private not-for-profit institutions, where most institutional grant aid is awarded, no measurable association could be detected between students' receipt of institutional grant aid as freshmen and their graduating from the awarding institution (compared to unaided students), once other factors such as students' academic merit, students' financial need, and institutional selectivity were taken into consideration.

# Foreword

This study provides information about recent trends in institutional aid receipt and then examines the relationship between such aid and the likelihood of recipients staying enrolled in the awarding institution relative to comparable unaided students. The trend analysis is based on data gathered from three administrations of the National Postsecondary Student Aid Study (NPSAS:92, NPSAS:96, and NPSAS:2000), and the retention analysis is based on data from the 1995–96 Beginning Postsecondary Students (BPS) Longitudinal Study, which followed a cohort of students who first enrolled in college in 1995–96 and were last surveyed in 2001, about 6 years after their initial enrollment. Only full-time students attending 4-year public and private not-for-profit institutions were included in these analyses.

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# Introduction

Many colleges and universities, both public and private, provide grant aid to undergraduates to help them pay for all or part of the tuition and fees charged by the institution. This practice, often referred to as "tuition discounting," has grown rapidly in recent years. For example, in a recent NCES study on college costs, researchers found that in the 10-year period between 1988–89 and 1998–99, institutional grant aid was the fastest growing expenditure at both public and private institutions. At public research/doctoral institutions, for example, institutional aid increased by 8.1 percent annually (adjusted for inflation), and in comparable private institutions, it increased by 8.8 percent annually (Cunningham, Wellman, Merisotis, and Clinedinst 2001). According to the annual Tuition Discounting Survey conducted by the National Association of College and University Business Officers (NACUBO), the average discounting rate as of February 2001 was 38.2 percent,[1] an increase of 1 percentage point from the previous year among small colleges, and 0.7 percent among large colleges and universities (Hubbell and Lapovsky 2002).

The growth in institutional aid awards has been accompanied by both an increase in tuition and fees and low growth in undergraduate enrollment. For example, between 1989–90 and 1998–99, inflation-adjusted tuition rose 41 percent at private not-for-profit 4-year institutions and 53 percent at public 4-year institutions. During the same period, median family income grew 10 percent, and federally sponsored Pell Grant programs—designed to assist low-income students pay for their college education—grew 19 percent (The College Board 1999). Undergraduate fall enrollment at 4-year institutions of higher education fluctuated during the period, increasing from 8.2 to 8.7 million between 1988 and 1991 and then remaining stable at between 8.7 and 8.8 million through 1997 (U.S. Department of Education 2001, table 174). However, the most recent projections from the Department of Education indicate that between 2000 and 2012, enrollment will increase about 19 percent in public 4-year institutions and about 16 percent at private 4-year institutions (U.S. Department of Education 2002).

In the 1990s, the increase in the price of attending college combined with low enrollment growth brought pressure on colleges and universities to attract, on one hand, meritorious or otherwise talented students who help maintain the institution's reputation and, on the other,

[1]The tuition discount rate is the product of the percentage of students who were aided and financial aid as a percent of tuition and fees. For example, if an institution aids 50 percent of its students with average grants of 80 percent of tuition, the discount rate is 40 percent (Hubbell and Lapovsky 2002).

students capable of paying all or part of their tuition. In addition, students and their parents are increasingly becoming more savvy consumers in shopping for the "best deal" offered by competing colleges.[2]

Depending on the type of institution and its selectivity, the institution uses tuition discounting for different reasons. Smaller, "less-selective" colleges may use it simply to attract enough students to achieve enrollment goals (Lee and Clery 1998). At the other extreme, "highly selective" institutions, capable of filling enrollment slots with students whose families can afford full tuition, may use discounts to "enhance the quality and diversity of their student bodies" (Allan 1999, p. 9). Many institutions are trying to do both—to enroll students with demonstrated financial need and high academic ability (Redd 2000). Increasingly, however, institutions are offering no-need scholarships to high-ability applicants in order to "attract and enroll students who otherwise would not attend an institution" (Duffy and Goldberg 1998, p. 208). Consequently, students from middle- and upper-income families often receive such merit-based financial aid (Duffy and Goldberg 1998).

Institutions that award grant aid may do so at a price. The more aid directed at incoming students, the more the institution has to raise tuition, reduce the amount it spends on instruction and other services, or do both (Allan 1999). This is especially true for colleges with little or no endowment or alumni support that can be targeted to institutional aid. To help with the increasingly complicated process of managing enrollment, many public and private colleges are hiring "deans of enrollment management" to help them balance the potentially conflicting needs of the students and the colleges (Toch 1998).

To achieve the goals of improving admissions yield or maximizing tuition, institutions may use two common strategies known as preferential packaging and price sensitivity. Preferential packaging aims to include more grant money and fewer loans and work-study in the need-based awards of the most desirable candidates in order to recognize their academic achievement or other distinctions (Duffy and Goldberg 1998, p. 222). In other words, within a need-based framework, the stronger a needy student's academic profile, the more attractive the aid package. Price sensitivity refers to the way in which students respond to the "sticker price" of the institution regardless of need. Depending on the value the institution places on the student, the institution packages financial aid based on how much a student wants to attend. For example, an institution may consider whether a student was admitted early or has previously visited the campus, combined with whether the student has applied to or been accepted by other colleges, when offering the student financial aid (Ehrenberg 2000). The question, therefore, is no longer

[2]See, for example, "Financial Aid Free-For-All" (2000).

who can afford to come at what price but rather "who is likely to come at what price" (Gaudiani 2000).

In an effort to boost tuition revenues, some institutions use another strategy: they offer a small amount of grant money to students who are not eligible for need-based aid. In attracting students with partial merit scholarships, institutions perceive a two-tiered effect: increasing the number of students with diverse talents and achievements, which in turn enhances its reputation and the value of its degrees, thus making that institution more attractive to other students.

Proponents of merit aid argue that it serves a social good by distributing the top-performing students throughout the colleges and universities rather than collecting them at the more prestigious institutions. McPherson and Schapiro (1991) found "...some evidence that highly talented students, at least in the right circumstances, confer educational benefits on their fellow students.... It may be useful to offer a merit scholarship to a student at a less prestigious institution as a 'payment' for an educational service that a student can perform" (p. 151). However, among schools of equal prestige or reputation, the same authors argue that the competition will simply "move students within this group of schools, but will not affect the overall distribution of high-ranking students by institutional quality" (McPherson and Schapiro 1994, p. 3). The main effect, the authors note, is to redistribute dollars between schools and students rather than to redistribute students among schools.

Whether colleges and universities can reconcile the potential conflicting aims of institutional financial aid—promoting access to low-income and otherwise disadvantaged students, increasing the enrollment of meritorious students, and increasing tuition revenues—it is possible that the current discounting practices may lead to losses in revenue without necessarily achieving the desired results. One study, for example, found that the least selective institutions—those with fewer resources and endowments—paid more nonneed aid per student than the most selective schools (McPherson and Schapiro 1998, pp. 116, 119). Another study determined that tuition discounts for a number of private institutions had led to losses in net revenue resulting in lower increases in the funds for instruction and other critical services to students (Redd 2000).[3] Further, the same study found that private institutions with the largest increases in spending on tuition discounting experienced the smallest increases in the number of freshmen resulting in a 5 percent decline in total undergraduate enrollments. The study, however, also concluded that tuition discounting increased the enrollment of low-income students at private colleges and universities.

[3]The study is based on a sample of 275 accredited 4-year private colleges and universities that responded annually (from 1990–91 to 1998–99) to the Institutional Student Aid Survey sponsored by NACUBO (Redd 2000, p. 9).

For those institutions that are successful in attracting new students, there is little information on how well they retain them. Redd (2000) examined the graduation rates of 187 NCAA-member private institutions who responded to the NACUBO survey to determine the extent to which they had increased their spending on tuition discounting. The results of this limited study suggested that colleges that had substantially increased their tuition discounting did not experience higher graduation rates 6 years later than colleges that had not increased their spending at that rate.

## Research Questions

The purpose of this study is to provide information about how institutional aid is distributed from the student perspective. The report first presents the general trend of institutional aid awards between 1992–93 and 1999–2000 and then analyzes the distribution of aid and institutional retention and degree attainment among first-year students who received institutional grant aid in 1995–96. The report addresses these major questions:

- What was the general trend of institutional aid awarded to full-time undergraduates enrolled in 4-year institutions between 1992–93 and 1999–2000? How did the distribution of institutional merit aid change over time?
- For those attending public and private not-for-profit 4-year institutions, how did institutional aid vary among 1995–96 full-time beginning students in terms of academic merit and financial need? And how did it vary by institution selectivity?
- As a percentage of tuition, how much institutional grant aid was awarded to beginning students with various combinations of merit and need?
- After 1 year and 6 years (as of 2001), did students who received institutional grant aid in their first year attain a degree or maintain their enrollment at the awarding institution at higher rates than those of comparable nonrecipients?

# Trends in Institutional Aid Receipt: 1992–93 to 1999–2000

## Data and Key Variables

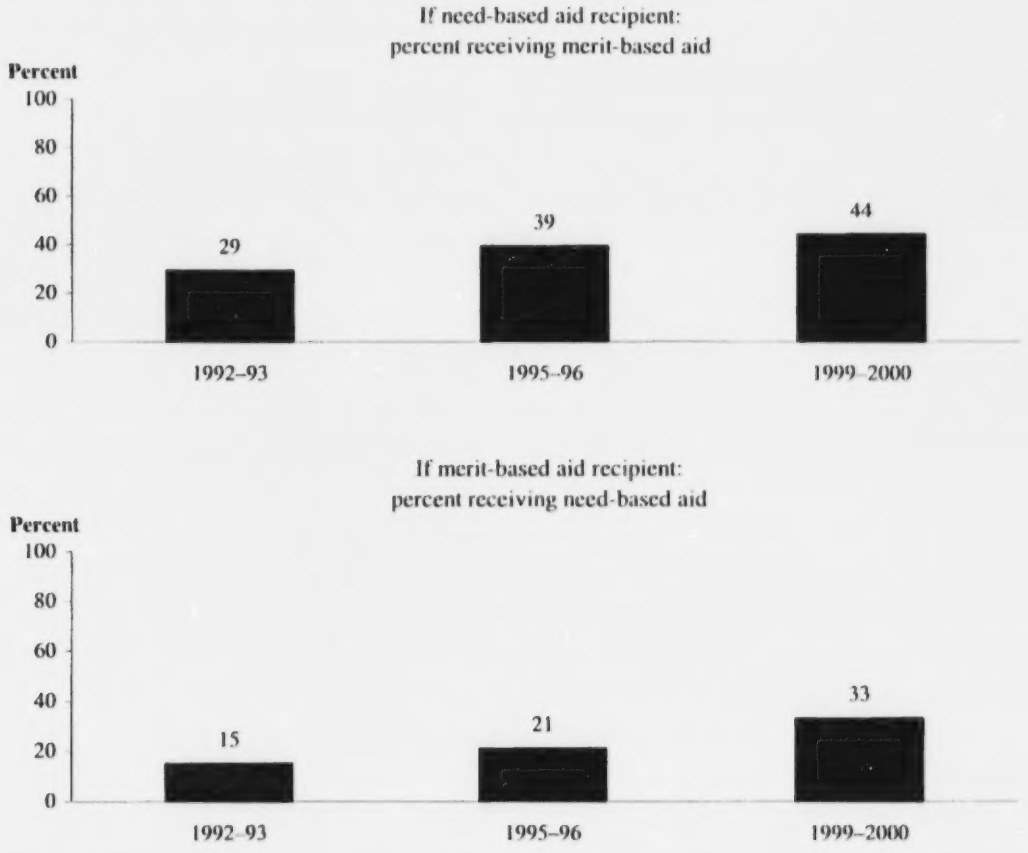
This analysis uses data from three National Postsecondary Student Aid Study (NPSAS) surveys (1992–93, 1995–96, and 1999–2000) to compare changes in institutional aid distribution and amounts after adjusting for inflation (to 1999 dollars). The NPSAS surveys are part of a series of NPSAS studies conducted by the National Center for Education Statistics at the U.S. Department of Education. Each survey includes a nationally representative sample of students from all backgrounds and types of postsecondary institutions. The surveys provide information on student expenses, tuition, financial aid, and academic and demographic characteristics. The analysis in this study compares the percentage of students who received institutional aid and among aid recipients, the average amount received.

### *Institutional Aid Total*

The institutional aid variable used in the analysis is equal to the sum of institutional grants and fellowships, loans, institution-sponsored work-study, and all other institutional amounts including assistantships. Almost all institutional aid is made up of grants,[4] which can be awarded based on a student's financial need, merit, or often, a combination of both. For example, in 1999–2000, among full-time institutional aid recipients enrolled in private not-for-profit 4-year institutions, 44 percent who received institutional aid on the basis of need also received aid on the basis of merit (figure 1). Correspondingly, 33 percent who received aid on the basis of merit also received aid on the basis of need. The need/merit institutional packages are awarded at the discretion of the institution and different institutions use different strategies. For example, a need-within-merit strategy uses merit criteria, but prioritizes the recipients on the basis of need, whereas the merit-within-need strategy awards aid on the basis of need, but prioritizes the recipients on the basis of merit.

[4]For example, in 1999–2000, among full-time undergraduates enrolled at 4-year institutions, 34 percent received institutional aid, all of whom received institutional grant aid (33 percent). In addition, 1 percent received loans and 3 percent received institutional work-study aid, which are not mutually exclusive to receiving grant aid (NPSAS:2000 Undergraduate Data Analysis System).

**Figure 1. Among full-time undergraduates in private not-for-profit 4-year institutions who received institutional aid, the percentage of need-based aid recipients who also received merit-based aid and the percentage of merit-based aid recipients who also received need-based aid: 1992–93, 1995–96, and 1999–2000**




SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93, 1995–96, and 1999–2000 National Postsecondary Student Aid Study (NPSAS:93/96/2000).

## *Institutional Merit Aid*

The institutional merit aid variable is the sum of all institutional scholarships and grants awarded based solely on merit. Merit aid is based primarily on academic merit, but also includes athletic and other merit scholarships. In 1999–2000, among full-time undergraduates enrolled in 4-year institutions who received merit-based institutional aid, 13 percent received an athletic scholarship.[5]

[5]NPSAS:2000 Undergraduate Data Analysis System.

## Changes in Total Institutional Aid Awards

Consistent with other studies reporting substantial increases in spending by 4-year institutions on institutional aid over the last decade (e.g., Redd 2000; Cunningham et al. 2001; Hubbell and Lapovsky 2002), this study found that the proportion of full-time undergraduates in 4-year colleges and universities who received institutional aid increased in both the public and private not-for-profit sectors between 1992–93 and 1999–2000. As shown in table 1a, in 1992–93, 17 percent of undergraduates in public institutions received institutional aid, averaging about $2,200 (after adjusting for inflation to 1999 dollars). By 1999–2000, 23 percent received institutional aid, averaging about $2,700. In private not-for-profit institutions (table 1b), 47 percent received institutional aid, averaging about $5,900 in 1992–93, while 58 percent received an average of about $7,000 in 1999–2000.

**Table 1a. Percentage of full-time undergraduates at public 4-year institutions who received institutional aid and among recipients, the average amount received in 1992–93, 1995–96, and 1999–2000, by selected characteristics**

| Characteristic | 1992–93 | | 1995–96 | | 1999–2000 | |
|---|---|---|---|---|---|---|
| | Received institutional aid | Average amount received[1] | Received institutional aid | Average amount received[1] | Received institutional aid | Average amount received |
| | | | Public | | | |
| Total | 17.5 | $2,222 | 20.0 | $2,506 | 23.5 | $2,659 |
| Gender | | | | | | |
| Male | 16.9 | 2,414 | 19.3 | 2,608 | 23.0 | 2,858 |
| Female | 18.1 | 2,054 | 20.6 | 2,423 | 23.9 | 2,500 |
| Dependency status | | | | | | |
| Dependent | 17.7 | 2,389 | 20.6 | 2,698 | 24.3 | 2,806 |
| Independent | 16.8 | 1,676 | 18.1 | 1,799 | 20.8 | 2,128 |
| Tuition and fees | | | | | | |
| Less than $2,200 | 15.1 | 1,609 | 19.4 | 1,621 | 20.5 | 1,616 |
| $2,200–3,999 | 18.7 | 1,977 | 18.1 | 2,030 | 22.4 | 2,258 |
| $4,000 or more | 22.5 | 3,808 | 24.4 | 3,872 | 27.2 | 3,736 |
| Income quartiles | | | | | | |
| Low quartile | 23.8 | 1,857 | 27.4 | 2,521 | 28.9 | 2,333 |
| Low middle quartile | 19.2 | 2,250 | 22.6 | 2,485 | 25.3 | 2,547 |
| High middle quartile | 15.3 | 2,670 | 17.0 | 2,367 | 21.3 | 2,894 |
| High quartile | 12.3 | 2,402 | 12.6 | 2,706 | 17.6 | 3,161 |

[1]Adjusted for inflation to 1999 dollars.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93, 1995–96, and 1999–2000 National Postsecondary Student Aid Study (NPSAS:93/96/2000).

**Table 1b. Percentage of full-time undergraduates at private not-for-profit 4-year institutions who received institutional aid and among recipients, the average amount received in 1992–93, 1995–96, and 1999–2000, by selected characteristics**

| Characteristic | 1992–93 | | 1995–96 | | 1999–2000 | |
|---|---|---|---|---|---|---|
| | Received institutional aid | Average amount received[1] | Received institutional aid | Average amount received[1] | Received institutional aid | Average amount received |
| | | | Private, not-for-profit | | | |
| Total | 47.1 | $5,903 | 54.9 | $6,005 | 57.8 | $7,019 |
| Gender | | | | | | |
| Male | 46.5 | 6,114 | 53.2 | 5,884 | 55.7 | 6,892 |
| Female | 47.6 | 5,717 | 56.1 | 6,093 | 59.4 | 7,109 |
| Dependency status | | | | | | |
| Dependent | 49.9 | 6,282 | 58.6 | 6,430 | 64.3 | 7,477 |
| Independent | 37.3 | 4,125 | 39.2 | 3,343 | 34.5 | 3,943 |
| Tuition and fees | | | | | | |
| Less than $7,500 | 33.0 | 3,011 | 37.2 | 2,362 | 32.5 | 2,982 |
| $7,500–12,499 | 58.0 | 4,925 | 60.5 | 4,456 | 61.3 | 4,459 |
| $12,500 or more | 49.4 | 8,753 | 61.6 | 8,084 | 68.1 | 8,757 |
| Income quartiles | | | | | | |
| Low quartile | 52.8 | 5,473 | 53.2 | 5,890 | 55.7 | 6,213 |
| Low middle quartile | 59.8 | 6,189 | 68.3 | 6,537 | 61.4 | 7,532 |
| High middle quartile | 54.9 | 6,696 | 61.0 | 6,003 | 64.6 | 7,410 |
| High quartile | 35.0 | 5,484 | 40.9 | 5,459 | 51.2 | 6,845 |

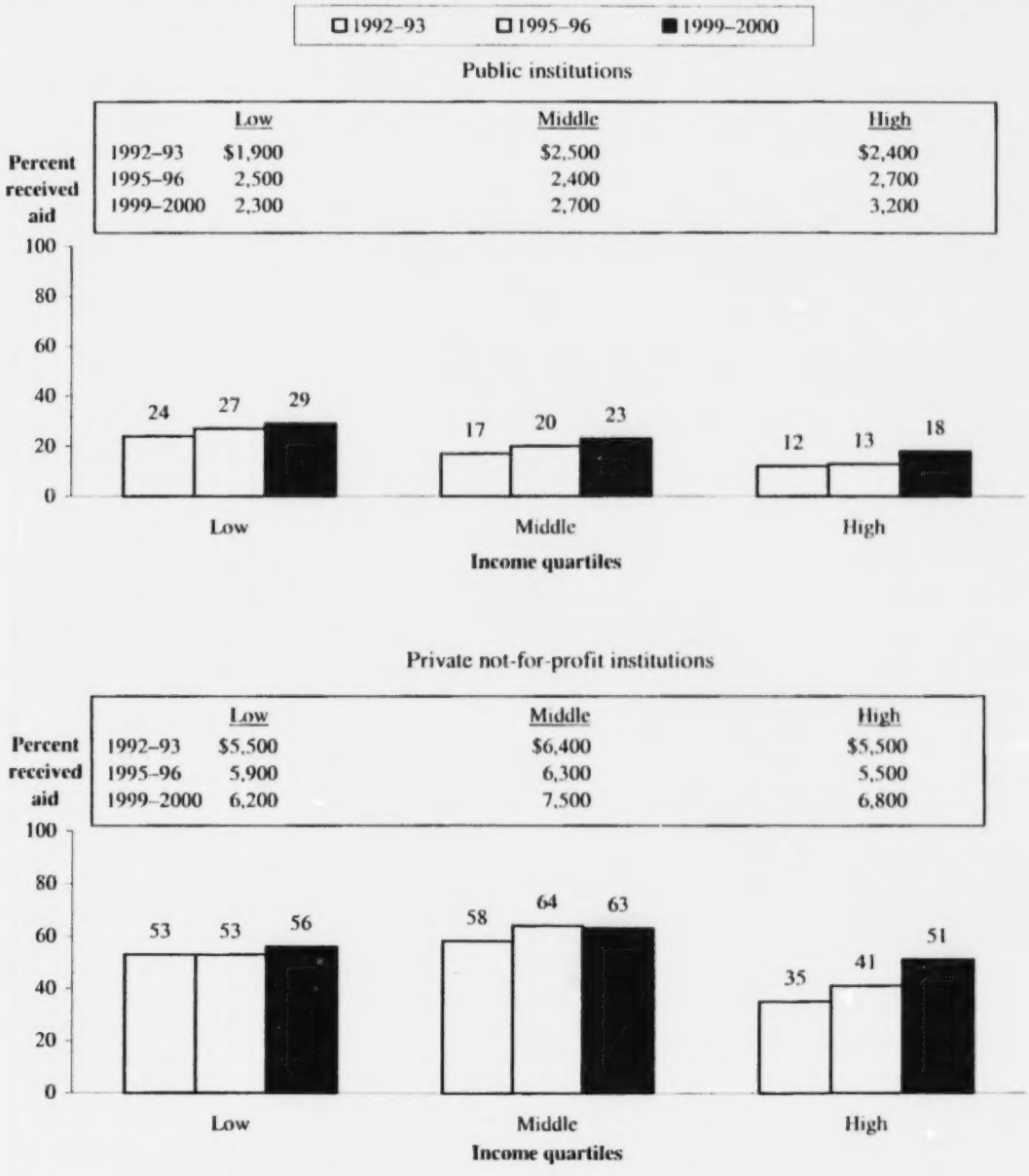
[1]Adjusted for inflation to 1999 dollars.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93, 1995–96, and 1999–2000 National Postsecondary Student Aid Study (NPSAS:93/96/2000).

Figure 2 displays the distribution of awards and the average amounts received by income quartiles, combining the middle two quartiles.[6] Apparent in this figure is the notable increase between 1995–96 and 1999–2000 in the percentage of institutional aid recipients in the highest income quartile, especially in the private not-for-profit sector (41 to 51 percent). However, an increase was also observed in the public sector (13 to 18 percent). In the private not-for-profit sector, no corresponding increase between 1995–96 and 1999–2000 was observed for those either in the lowest or middle-income quartiles. Similarly, in the public sector, no increase between 1995–96 and 1999–2000 was observed for those in the lowest quartile, but the percentage in the middle-income quartiles increased from 20 to 23 percent. In the discussion that follows, analyses for public and private not-for-profit institutions are presented separately.

[6]All four income quartiles are shown in tables 1a and 1b.

**Figure 2. Percentage of full-time undergraduates enrolled in 4-year institutions who received institutional aid and among recipients, the average amount received in constant 1999 dollars, by income quartile: 1992–93, 1995–96, and 1999–2000**




SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93, 1995–96, and 1999–2000 National Postsecondary Student Aid Study (NPSAS:93/96/2000).

### *Public Institutions*

In the public sector, the likelihood of receiving institutional aid was directly related to income: the lower the income level, the more likely students were to receive institutional aid (figure 2). In each survey year, students in the lowest income quartile were more likely to receive institutional grant aid than those in the middle quartiles, and in turn, those in the middle quartiles were more likely to receive it than those in the highest quartiles.

Among those who received institutional aid, the relationship between the average amounts awarded and income levels differed in each survey year. In 1992–93, middle- and high-income aid recipients received an average of $2,500 and $2,400 respectively, and both groups received more than those in the lowest income quartile ($1,900). In 1995–96, no differences in the average amounts of aid awarded could be detected across all income levels, while in 1999–2000, as income levels rose among aid recipients, so did the average amounts awarded, from $2,300 for low-income recipients to $2,700 for middle-income recipients, to $3,200 for high-income recipients.

### *Private Not-for-Profit Institutions*

The findings for students in private not-for-profit institutions did not parallel those for students in public institutions. As shown in figure 2, students in the middle-income quartiles were more likely to receive institutional aid than those in the highest quartile in all three survey years; middle-income students were also more likely than those in the lowest quartile to receive aid in 1995–96 and 1999–2000. At the same time, the percentage of high-income students receiving institutional aid increased in each survey year from 35 to 41 to 51 percent. In contrast, no increases across any survey year were detected for low-income students, and the only increase observed for middle-income students occurred between 1992–93 and 1995–96. Thus, by 1999–2000, no difference between the lowest and highest income quartiles in the percentage receiving aid could be detected statistically, and while the difference between the middle- and high-income quartiles was still significant, the gap between the two groups had diminished significantly when compared with 1995–96.

Among institutional aid recipients in private not-for-profit institutions, those in the middle-income quartiles received higher amounts of aid on average than those in either the low- or high-income quartiles in all survey years. In 1999–2000, middle-income recipients were awarded an average $7,500, compared with $6,200 and $6,800, respectively for low- and high-income students. No differences in the amounts received between recipients in the highest and lowest income quartiles could be detected statistically.

## Changes in Institutional Merit-Based Grants

Much of the increase in institutional aid awards between 1995–96 and 1999–2000 was due to an increase in awards based entirely on merit. During this period, the percentage of full-time undergraduates who received institutional merit aid awards increased from 7 to 10 percent in public institutions (table 2a) and from 21 to 29 percent in private not-for-profit institutions (table 2b).[7] In contrast, between 1992–93 and 1995–96, no increase was detected in students' likelihood of receiving merit aid in either public institutions or private not-for-profit institutions. In addition, the average amount of merit aid awards to aid recipients increased from $4,400 to $5,000 at private not-for-profit institutions between 1992–93 and 1999–2000, while no

**Table 2a. Percentage of full-time undergraduates at public 4-year institutions who received institutional merit-based grants and among recipients, the average amounts received in 1992–93, 1995–96, and 1999–2000, by selected characteristics**

| | 1992–93 | | 1995–96 | | 1999–2000 | |
|---|---|---|---|---|---|---|
| Characteristic | Received institutional merit-based grants | Average amount received[1] | Received institutional merit-based grants | Average amount received[1] | Received institutional merit-based grants | Average amount received |
| | | | Public | | | |
| Total | 7.4 | $2,655 | 7.0 | $2,864 | 9.6 | $2,773 |
| Gender | | | | | | |
| Male | 7.6 | 3,005 | 7.1 | 2,925 | 9.7 | 3,024 |
| Female | 7.2 | 2,308 | 6.9 | 2,809 | 9.4 | 2,559 |
| Dependency status | | | | | | |
| Dependent | 8.3 | 2,793 | 8.3 | 2,956 | 10.8 | 2,909 |
| Independent | 4.6 | 1,881 | 2.7 | 1,934 | 5.8 | 1,988 |
| Tuition and fees | | | | | | |
| Less than $2,200 | 6.3 | 1,914 | 6.1 | 1,830 | 7.3 | 1,787 |
| $2,200–3,999 | 7.8 | 2,217 | 7.0 | 2,335 | 9.6 | 2,149 |
| $4,000 or more | 9.9 | 4,899 | 8.4 | 4,467 | 12.0 | 4,056 |
| Income quartiles | | | | | | |
| Low quartile | 7.3 | 2,185 | 7.6 | 3,307 | 8.2 | 2,486 |
| Low middle quartile | 7.1 | 2,834 | 7.0 | 2,883 | 9.8 | 2,795 |
| High middle quartile | 8.4 | 3,171 | 7.1 | 2,437 | 10.4 | 2,877 |
| High quartile | 6.8 | 2,518 | 6.2 | 2,759 | 10.0 | 2,914 |

[1]Adjusted for inflation to 1999 dollars.

NOTE: Students who receive merit-based grants may also receive need-based grants.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93, 1995–96, and 1999–2000 National Postsecondary Student Aid Study (NPSAS:93/96/2000).

[7]Merit aid awards are included in total aid awards discussed previously and presented in tables 1a and 1b.

**Table 2b. Percentage of full-time undergraduates at private not-for-profit 4-year institutions who received institutional merit-based grants and among recipients, the average amount received in 1992–93, 1995–96, and 1999–2000, by selected characteristics**

| Characteristic | 1992–93 | | 1995–96 | | 1999–2000 | |
|---|---|---|---|---|---|---|
| | Received institutional merit-based grants | Average amount received[1] | Received institutional merit-based grants | Average amount received[1] | Received institutional merit-based grants | Average amount received |
| | Private not-for-profit | | | | | |
| Total | 17.1 | $4,421 | 21.2 | $4,739 | 28.9 | $5,014 |
| Gender | | | | | | |
| Male | 17.2 | 4,636 | 20.0 | 5,170 | 26.2 | 5,183 |
| Female | 17.0 | 4,225 | 22.1 | 4,441 | 31.0 | 4,905 |
| Dependency status | | | | | | |
| Dependent | 19.1 | 4,595 | 23.6 | 4,939 | 32.7 | 5,263 |
| Independent | 10.3 | 3,290 | 10.9 | 2,922 | 15.4 | 3,111 |
| Tuition and fees | | | | | | |
| Less than $7,500 | 14.8 | 2,817 | 12.3 | 2,699 | 17.8 | 2,836 |
| $7,500–12,499 | 24.7 | 4,267 | 28.7 | 4,050 | 33.0 | 3,645 |
| $12,500 or more | 12.0 | 6,501 | 22.0 | 5,879 | 32.9 | 6,091 |
| Income quartiles | | | | | | |
| Low quartile | 15.2 | 3,556 | 18.3 | 4,292 | 22.6 | 4,085 |
| Low middle quartile | 20.9 | 3,965 | 25.7 | 5,118 | 30.8 | 4,662 |
| High middle quartile | 22.0 | 5,365 | 24.3 | 4,631 | 33.2 | 5,039 |
| High quartile | 14.9 | 4,702 | 17.6 | 4,838 | 29.1 | 5,879 |

[1]Adjusted for inflation to 1999 dollars.

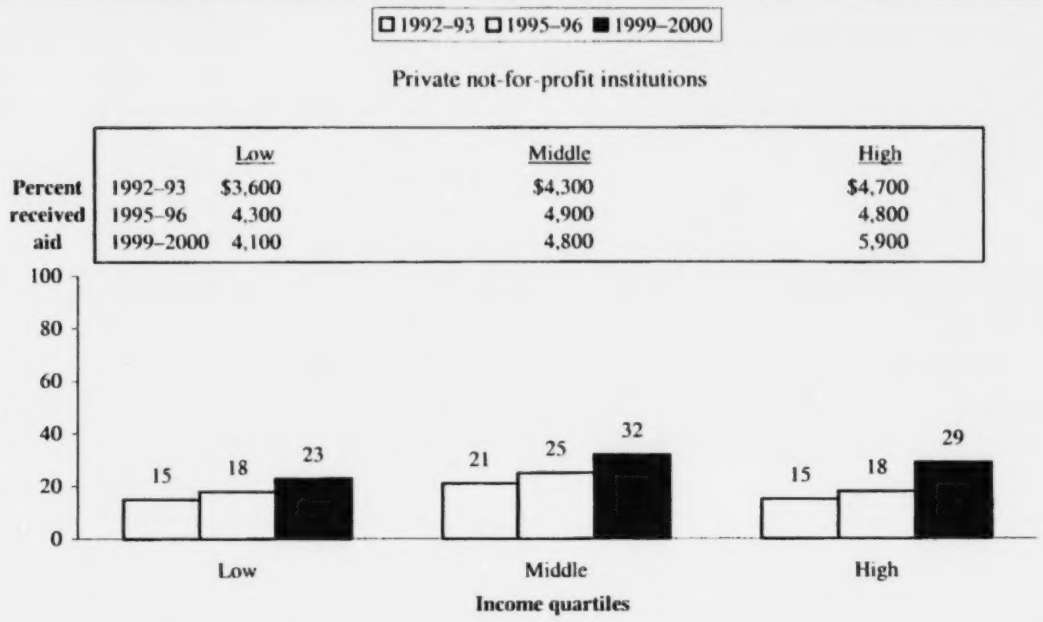
NOTE: Students who receive merit-based grants may also receive need-based grants.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93, 1995–96, and 1999–2000 National Postsecondary Student Aid Study (NPSAS:93/96/2000).

corresponding increase was observed at public institutions (roughly $2,700 in merit aid was awarded in both years).

The likelihood of receiving merit aid did not vary by family income in public 4-year institutions (i.e., no differences were detected among income quartiles in all three survey years) (table 2a). In private not-for-profit institutions, on the other hand, differences were detected over time. As shown in figure 3, in 1992–93 and 1995–96, undergraduates in the combined middle-income quartiles were more likely than students in both the highest- and lowest-income quartiles to receive merit aid. By 1999–2000, however, no difference could be detected between those in the middle- and high-income quartiles (roughly 30 percent received merit aid), and the lowest income students were the least likely of all to receive such aid (23 percent).

**Figure 3. Percentage of full-time undergraduates enrolled in private not-for-profit 4-year institutions who received merit-based institutional aid and among recipients, the average amount received in constant 1999 dollars, by income quartile: 1992–93, 1995–96, and 1999–2000**




SOURCE: U.S. Department of Education, National Center for Education Statistics, 1992–93, 1995–96, and 1999–2000 National Postsecondary Student Aid Study (NPSAS:93/96/2000).

In other words, in the early to mid-1990s, middle-income students appeared to be favored for receiving merit aid over both high- and low-income students in private not-for-profit institutions, as was determined for total aid awards. This finding might be expected because low-income students are more likely to receive need-based financial aid and high-income students have more discretionary income to pay tuition. But by 1999–2000, no difference could be detected in the percentage of those in the middle- and high-income quartiles who received merit aid, and students in both groups were more likely than their low-income peers to do so.

In summary, the trend analysis of institutional aid receipt indicated that the percentage of full-time students receiving institutional aid increased between the early and late 1990s. Increases in the proportions of students who received institutional aid in the latter time period (between 1995–96 and 1999–2000) were especially apparent for those in the highest income quartile, and much of this increase was in the form of aid based exclusively on merit.

# Academic Merit, Financial Need, and Institutional Grant Aid Among Beginning Students in 1995–96

## Data and Key Variables

As part of the 1995–96 National Postsecondary Student Aid Study (NPSAS:96) survey, a cohort of students who had enrolled in college for the first time was identified and subsequently followed up in 1998 and 2001 in the Beginning Postsecondary Students Longitudinal Study (BPS:96/2001). This cohort was analyzed to determine how institutional grant aid was awarded to entering students in their first year in relation to their academic merit and financial need and then to examine whether institutional grant aid was associated with students' likelihood of staying enrolled at the awarding institution. The BPS data set includes information obtained from the Educational Testing Service (ETS) and the ACT Assessment® program on academic courses that students reported taking; this information was used to determine students' academic merit. The study is limited to full-time students enrolled in 4-year public or private not-for-profit institutions. Several BPS variables, which are described below, were created for this analysis.

### *Academic Merit Index*

One key analytic variable created for this report is an index that identifies three levels of high school academic merit. The merit index is based on SAT (or equivalent ACT) scores, high school academic curriculum, and high school grade-point average (GPA). Values for each of the three component variables (exam scores, curriculum, and GPA) were roughly divided into quartiles (combining the middle two), with three possible values for each variable representing low (1), middle (2), and high (3) levels. Students' merit index scores were empirically assigned to merit levels based on their likelihood of enrolling in selective institutions. Because institution selectivity is based almost exclusively on SAT score distributions, this empirical coding scheme was closely aligned to SAT scores. However, there were some exceptions: students with middle-level SAT scores but high-level curriculum and GPA scores were coded as "high merit"; students with high-level SAT scores but either a low curriculum or GPA score were coded as "middle merit"; and students with middle-level SAT scores but low curriculum and GPA scores were coded as "low merit." In this way, the merit index provided a more comprehensive depiction of students' academic accomplishments.

Among 1995–96 full-time beginning 4-year college students, 29 percent were in the low-merit group, 44 percent were in the middle-merit group, and 28 percent demonstrated high-level academic merit (table 3a). Among those whose SAT score was in the highest quartile (1100 to 1600), 93 percent were in the high-merit group, and 7 percent were in the middle-merit group. Similarly, 84 percent of those who completed a rigorous academic curriculum in high school were in the high-merit group, and 15 percent demonstrated middle-level academic merit. The average SAT score of students identified with low academic merit was 728, virtually none (0.2 percent) of the low-merit students had completed a rigorous academic curriculum, and 14 percent earned mostly As in high school (table 3b). In contrast, among those identified as achieving high-level academic merit, their average SAT score was 1192, more than one-half completed rigorous high school curricula (57 percent), and 84 percent earned mostly As in high school.

**Table 3a. Percentage distribution by high school academic merit index levels among 1995–96 beginning full-time students in 4-year institutions, by SAT scores, high school academic curriculum, and high school GPA**

| Characteristic | Academic merit index[1] | | |
|---|---|---|---|
| | Low | Middle | High |
| Total | 28.5 | 44.1 | 27.5 |
| Derived SAT combined score | | | |
| Lowest quartile (400–790) | 98.5 | 1.5 | # |
| Middle quartiles (800–1090) | 9.4 | 82.1 | 8.5 |
| Highest quartile (1100–1600) | # | 7.1 | 93.0 |
| High school academic curriculum[2] | | | |
| Core or below | 57.5 | 34.6 | 7.9 |
| Mid-level | 23.1 | 57.6 | 19.3 |
| Rigorous | 0.3 | 15.4 | 84.3 |
| High school GPA | | | |
| B- to B or lower | 65.5 | 33.4 | 1.1 |
| As and Bs | 22.5 | 63.1 | 14.4 |
| A- to A | 7.6 | 36.5 | 55.9 |

#Rounds to zero.

[1]Based on a composite index of SAT score, high school academic curriculum, and high school grades (see appendix A for details).

[2]Core curriculum includes 4 years of English, and 3 years each of social studies, mathematics, and science. Mid-level curriculum exceeds core curriculum, but is less than rigorous. Includes at a minimum 1 year of a foreign language, geometry, algebra I, and 3 years of science including two of the following courses: biology, chemistry, or physics. Rigorous curriculum includes 4 years of English, 4 years of mathematics (including precalculus or higher), 3 years each of a foreign language, social studies, science (including biology, chemistry, physics), and at least one advanced placement (AP) class or test taken.

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/98 Beginning Postsecondary Students Longitudinal Study, "First Follow-up" (BPS:96/98).

**Table 3b. Among 1995–96 beginning full-time students in 4-year institutions, average SAT composite score, percentage completing rigorous high school academic curricula, and percentage earning mostly As in high school, by high school academic merit index**

| Academic merit index | Average SAT score | Percent completing rigorous high school academic curriculum[1] | Percent earning mostly As in high school |
|---|---|---|---|
| Total | 955 | 19.2 | 45.5 |
| Academic merit index[2] | | | |
| Low | 728 | 0.2 | 13.5 |
| Middle | 954 | 7.0 | 37.7 |
| High | 1192 | 57.3 | 84.4 |

[1]Rigorous curriculum includes 4 years of English, 4 years of mathematics (including precalculus or higher), 3 years each of a foreign language, social studies, and science (including biology, chemistry, physics), and at least one advanced placement (AP) class or test taken.

[2]Based on a composite index of SAT score, high school academic curriculum, and grades in high school (see appendix A for details).

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/98 Beginning Postsecondary Students Longitudinal Study, "First Follow-up" (BPS:96/98).

## *Financial Need*

While family income and a student's financial need are highly related, they are not equivalent. Low-income students are not necessarily considered students with high need nor are middle- or high-income students always considered those with lesser need. Under federal need analysis methodology, the expected family contribution (EFC) is calculated using parent and student income, assets, and family size, among other factors. A student's need is calculated by subtracting the EFC from the total price of attendance, which is not only dependent on tuition and fees, but is also sensitive to the type of living arrangement a student chooses. Therefore, depending upon the amount of tuition and the cost of living, a student at one institution may have moderate or high financial need while at another he or she may have no need at all. At an institution that charges high tuition, middle- and higher-income students may have considerable need while at a school with low tuition, even low-income students may have little or no need.

In this analysis, financial need is defined as the need remaining after both the EFC and federal and state grants were subtracted from the student budget.[8] This remaining need is the amount a student would have to pay through loans, work, or other means. It is also the amount that institutions typically take into account before committing their own funds.

[8]The budget includes tuition and fees and nontuition costs including books, supplies, room and board, transportation, and other personal expenses.

After students' remaining need was determined, need amounts were divided into approximate quartiles (combining the middle two), separately for public and private not-for-profit institutions. However, in the public sector, about one-third of beginning students had no remaining financial need after subtracting the EFC and federal and state grant aid. This group formed the lowest need category (referred to as "no need") for students attending public institutions. For simplicity, throughout the analysis, this remaining financial need value is referred to as "financial need" or simply as "need."

### *Need and Income*

Among full-time beginning students enrolled in public 4-year institutions in 1995–96, the three levels of financial need were: 33 percent with no need, 42 percent with moderate need (less than $6,000), and 25 percent with high need ($6,000 or more) (table 4a). The average total need, including those with zero need, was about $3,600. The average financial need of those in the lowest income quartile was about $6,200, compared with about $900 for those in the highest income quartile. Among low-income students enrolled in public 4-year institutions, 55 percent were identified as having moderate need, and 43 percent as having high need. The remaining 2 percent showed no need. In contrast, roughly three-fourths (78 percent) of high-income students had no remaining financial need after EFC and federal and state grant aid were subtracted, 16 percent had moderate need, and 6 percent had high need.

**Table 4a. Percentage distribution by financial need quartiles and average need and tuition among 1995–96 beginning full-time students in public 4-year institutions, by family income quartiles**

| | Need distribution[1] | | | | |
|---|---|---|---|---|---|
| Family income quartiles | No need | Moderate need (less than $6,000) | High need ($6,000 or more) | Average need[2] | Average tuition and fees |
| Total | 33.1 | 42.3 | 24.6 | $3,604 | $3,551 |
| Income quartiles | | | | | |
| Low quartile | 1.6 | 55.4 | 43.1 | 6,232 | 2,997 |
| Middle quartiles | 21.0 | 52.0 | 27.0 | 4,006 | 3,191 |
| High quartile | 78.4 | 15.5 | 6.1 | 858 | 4,596 |

[1]Need is defined as the amount remaining after the Expected Family Contribution (EFC) and federal and state grants are subtracted from the total student budget.

[2]Includes those with zero need.

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/98 Beginning Postsecondary Students Longitudinal Study, "First Follow-up" (BPS:96/98).

Among those enrolled in private not-for-profit institutions, the three levels of financial need were: 24 percent with low need (less than $4,000), 51 percent with moderate need ($4,000–15,500), and 25 percent with high need (more than $15,500), with an average need of about $10,300 (table 4b). Among students in private not-for-profit institutions, roughly 60 percent of students in either low- or middle-income quartiles had moderate financial need ($4,000–15,500), while about one-third had high need (more than $15,500). The similarity in need between those in the low- and middle-income quartiles is partly due to differences in the average tuition they paid: with each successive income level, the average tuition increased. The average amount of need among those in either the low- or middle-income quartiles was about $12,000, compared with about $6,000 for students in the highest income quartile.

### *Institution Selectivity*

The selectivity variable identifies institutions in which the 25th percentile of SAT I and ACT scores of freshmen entering in fall 1997 was above 1000. In other words, very selective institutions are those in which at least 75 percent of entering undergraduates scored above 1000 on their entrance exams. The remaining institutions were then identified as "less selective."[9]

**Table 4b. Percentage distribution by financial need quartiles and average need and tuition among 1995–96 beginning full-time students in private not-for-profit 4-year institutions, by family income quartiles**

| | Need distribution[1] | | | | |
|---|---|---|---|---|---|
| Family income quartiles | Low need (less than $4,000) | Moderate need ($4,000–15,500) | High need (more than $15,500) | Average need[2] | Average tuition and fees |
| Total | 24.4 | 51.0 | 24.6 | $10,277 | $12,241 |
| Income quartiles | | | | | |
| Low quartile | 5.9 | 61.6 | 32.5 | 12,691 | 10,052 |
| Middle quartiles | 10.6 | 58.5 | 30.8 | 12,394 | 12,074 |
| High quartile | 56.2 | 33.4 | 10.5 | 5,658 | 13,902 |

[1]Need is defined as the amount remaining after the Expected Family Contribution (EFC) and federal and state grants are subtracted from the total student budget.

[2]Includes those with zero need.

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/98 Beginning Postsecondary Students Longitudinal Study, "First Follow-up" (BPS:96/98).

[9]The analysis originally identified three levels of institution selectivity, but due to small sample sizes and similar institutional aid patterns, the lower two categories were combined into one.

Among beginning full-time college students who attended 4-year institutions in 1995–96, 27 percent were enrolled in very selective institutions (table 5). Among those enrolled in public institutions, 54 percent of high-merit students were enrolled in very selective institutions,

**Table 5. Percentage distribution by institution selectivity among 1995–96 beginning full-time students in 4-year institutions, by control of institution, high school academic merit, and financial need**

| Characteristic | Less selective[1] | Very selective[1] |
|---|---|---|
| | All 4-year | |
| Total | 72.9 | 27.1 |
| Academic merit index[2] | | |
| Low merit | 95.1 | 5.0 |
| Middle merit | 74.9 | 25.1 |
| High merit | 40.6 | 59.4 |
| | Public | |
| Total | 76.4 | 23.6 |
| Academic merit index[2] | | |
| Low merit | 95.2 | 4.8 |
| Middle merit | 76.1 | 23.9 |
| High merit | 45.8 | 54.2 |
| Student financial need[3] | | |
| No need | 69.3 | 30.7 |
| Moderate (less than $6,000) | 86.4 | 13.6 |
| High ($6,000 or more) | 68.9 | 31.2 |
| | Private not-for-profit | |
| Total | 66.9 | 33.1 |
| Academic merit index[2] | | |
| Low | 94.8 | 5.2 |
| Middle | 72.5 | 27.5 |
| High | 34.7 | 65.3 |
| Student financial need[3] | | |
| Low (less than $4,000) | 64.7 | 35.3 |
| Moderate ($4,000–15,500) | 82.1 | 17.9 |
| High (more than $15,500) | 37.5 | 62.5 |

[1]Very selective institutions are those in which at least 75 percent of entering students scored above 1000 on the SAT exam. Less selective institutions are all others.

[2]Rigorous curriculum includes 4 years of English, 4 years of mathematics (including precalculus or higher), 3 years each of a foreign language, social studies, and science (including biology, chemistry, physics), and at least one advanced placement (AP) class or test taken.

[3]Need is defined as the amount remaining after the Expected Family Contribution (EFC) and federal and state grants are subtracted from the total student budget.

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/98 Beginning Postsecondary Students Longitudinal Study, "First Follow-up" (BPS:96/98).

compared with 24 percent of middle-merit and 5 percent of low-merit students. Also, in public institutions, 14 percent of students with moderate need were enrolled in very selective institutions, while about one-third (31 percent) of students with either no need or high need were so enrolled.

Among beginning full-time students enrolled in private not-for-profit institutions, 65 percent of high-merit students were enrolled in very selective institutions, compared with 28 percent of middle-merit and 5 percent of low-merit students. Examining need levels of students enrolled in very selective institutions, roughly two-thirds (63 percent) of those with high need, compared to about one-third (35 percent) of those with low need were enrolled, while those with moderate need were the least likely to be enrolled in very selective institutions (18 percent).

## Who Receives Institutional Grant Aid

Among 1995–96 full-time undergraduates enrolled in 4-year public and private not-for-profit institutions, approximately 38 percent received institutional grant aid (table 6). Students enrolled in private not-for-profit institutions were much more likely to receive institutional grant aid, than their counterparts in public institutions (62 vs. 24 percent). In public institutions, roughly one-quarter received institutional aid whether in less selective or very selective institutions. In private not-for-profit institutions, on the other hand, those in less selective institutions were more likely to receive institutional aid than students in very selective institutions (66 vs. 52 percent). Within institutional sectors and within selectivity, differences in the receipt of institutional grant aid also varied with respect to students' academic merit and financial need. The following sections discuss public and private not-for-profit institutions separately.

### *Public Institutions*

The patterns of institutional aid awards in public institutions with respect to academic merit and financial need is shown in table 6. In less selective institutions, students who had achieved high levels of academic merit in high school were more likely to receive institutional grant aid than those with lower levels of merit: roughly one-half (52 percent) of high-merit students, compared with roughly one-fifth of those with either middle (21 percent) or low (17 percent) levels of merit. In very selective institutions, on the other hand, there was no apparent linear association between academic merit and institutional aid receipt. Comparing less selective with very selective public institutions, students with high academic merit were more likely to receive institutional aid in less selective (52 percent) than in very selective institutions (27 percent),

**Table 6. Percentage of 1995–96 beginning full-time students in 4-year institutions who received institutional grant aid, by high school academic merit, financial need, and institution selectivity**

| Academic merit index and financial need | Less selective[1] | Very selective[1] | Total |
|---|---|---|---|
| Total | 37.5 | 37.6 | 37.5 |
| | | Public | |
| Total | 23.2 | 25.6 | 23.8 |
| Academic merit index[2] | | | |
| Low | 17.2 | 34.7 | 18.0 |
| Middle | 21.5 | 21.6 | 21.5 |
| High | 52.4 | 27.3 | 38.8 |
| Student financial need[3] | | | |
| No need | 16.3 | 9.1 | 14.1 |
| Moderate (less than $6,000) | 23.1 | 20.7 | 22.8 |
| High ($6,000 or more) | 33.0 | 48.6 | 37.9 |
| | | Private not-for-profit | |
| Total | 66.3 | 52.1 | 61.6 |
| Academic merit index[2] | | | |
| Low | 62.1 | 37.2 | 60.8 |
| Middle | 69.2 | 56.6 | 65.7 |
| High | 87.2 | 50.8 | 63.4 |
| Student financial need[3] | | | |
| Low (less than $4,000) | 51.0 | 21.0 | 40.4 |
| Moderate ($4,000–15,500) | 71.0 | 58.7 | 68.8 |
| High (more than $15,500) | 71.0 | 66.0 | 67.9 |

[1]Very selective institutions are those in which at least 75 percent of entering students scored above 1000 on the SAT exam. Less selective institutions are all others.

[2]Based on a composite index of SAT score, high school academic curriculum, and high school grades (see appendix A for details).

[3]Need is defined as the amount remaining after the Expected Family Contribution (EFC) and federal and state grants are subtracted from the total student budget.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1995/96 Beginning Postsecondary Students Longitudinal Study, "First Follow-up" (BPS:96/98).

while the opposite occurred for low-merit students: those in very selective institutions were more likely to receive aid (35 percent) than in less selective institutions (17 percent).

In both less selective and very selective public institutions, a relationship between financial need and institutional aid receipt was also evident. As levels of financial need rose, so did students' likelihood of receiving institutional grant aid. However, differences between less

selective and very selective institutions were also observed. Students with no remaining financial need were more likely to receive institutional grant aid in less selective (16 percent) than in very selective institutions (9 percent), while the opposite was observed for students with high financial need: those in very selective institutions were more likely to receive aid (49 percent) than in less selective institutions (33 percent).

### *Need by Merit*

Table 7a shows the patterns between financial need and institutional grant aid receipt for each level of academic merit. As was determined overall, within each level of merit, in less selective and very selective institutions, as students' financial need increased, so did their likelihood of receiving institutional grant aid. This was statistically confirmed for low-merit and middle-merit students in less selective institutions and for middle-merit and high-merit students in very selective institutions. There were too few cases of low-merit students in very selective institutions and the standard errors for high-merit students in less selective institutions were too large to determine an association between financial need and institutional receipt statistically. There were notable differences between less selective and very selective institutions. In particular, high-merit students with either no need (44 vs. 14 percent) or moderate need (52 vs. 23 percent) were more likely to receive institutional grant aid at less selective than very selective institutions.[10]

### ***Private Not-for-Profit Institutions***

As shown in table 6, in private not-for-profit institutions, a positive association between levels of academic merit and institutional aid receipt was evident in less selective institutions, but not in very selective institutions. That is, in less selective institutions, as levels of academic merit increased there was a corresponding increase in the likelihood of receiving institutional grant aid: from 62 percent for low-merit students, to 69 percent for middle-merit students, to 87 percent for high-merit students. A similar pattern could not be detected for students in very selective institutions. In very selective institutions, on the other hand, there was a clear association between students' financial need and the likelihood of receiving institutional grant aid, from 21 to 59 to 66 percent for low-, moderate-, and high-need students, respectively. In less selective institutions, while there was an association between need and aid receipt, fully 51 percent of low-need students received institutional grant aid, while 71 percent of both moderate- and high-need students did so.

[10]Due to the small sample size of students with both high merit and high need enrolled in less selective institutions, there was not enough statistical evidence to confirm a difference between less selective and very selective institutions in their likelihood of receiving institutional grant aid.

**Table 7a. Percentage of 1995–96 beginning full-time students in 4-year institutions who received institutional grant aid, by financial need within high school academic merit levels**

| Financial need | All students[1] | Academic merit index[2] | | |
|---|---|---|---|---|
| | | Low | Middle | High |
| | | Public | | |
| | | *Less selective*[3] | | |
| Total | 24.2 | 17.2 | 21.5 | 52.4 |
| Student financial need[4] | | | | |
| No need | 17.0 | 4.5 | 16.3 | 43.8 |
| Moderate (less than $6,000) | 24.2 | 17.7 | 22.6 | 52.2 |
| High ($6,000 or more) | 34.9 | 29.9 | 28.8 | 65.5 |
| | | *Very selective*[3] | | |
| Total | 25.2 | 34.7 | 21.6 | 27.3 |
| Student financial need[4] | | | | |
| No need | 9.1 | ‡ | 1.5 | 14.3 |
| Moderate (less than $6,000) | 20.8 | ‡ | 18.2 | 22.7 |
| High ($6,000 or more) | 47.8 | 60.8 | 38.1 | 57.4 |
| | | Private not-for-profit | | |
| | | *Less selective*[3] | | |
| Total | 69.9 | 62.1 | 69.2 | 87.2 |
| Student financial need[4] | | | | |
| Low (less than $4,000) | 52.0 | 40.8 | 46.8 | 85.2 |
| Moderate ($4,000–15,500) | 76.1 | 68.3 | 77.8 | 88.4 |
| High (more than $15,500) | 71.8 | 66.7 | 69.4 | 84.7 |
| | | *Very selective*[3] | | |
| Total | 52.1 | 37.2 | 56.6 | 50.8 |
| Student financial need[4] | | | | |
| Low (less than $4,000) | 20.7 | ‡ | 24.6 | 19.9 |
| Moderate ($4,000–15,500) | 58.7 | ‡ | 65.2 | 56.7 |
| High (more than $15,500) | 66.3 | ‡ | 70.2 | 64.4 |

‡Reporting standards not met (too few cases).

[1]Totals may not match percentages in table 6 exactly because they are for respondents with a valid merit index. There were about 7 percent of respondents missing the merit index, which accounts for the differences.

[2]Based on a composite index of SAT score, high school academic curriculum, and high school grades (see appendix A for details).

[3]Very selective institutions are those in which at least 75 percent of entering students scored above 1000 on the SAT exam. Less selective institutions are all others.

[4]Need is defined as the amount remaining after the Expected Family Contribution (EFC) and federal and state grants are subtracted from the total student budget.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1995/96 Beginning Postsecondary Students Longitudinal Study, "First Follow-up" (BPS:96/98).

### *Need by Merit*

Looking at patterns of institutional grant aid receipt for students in each level of academic merit (table 7a), what is clearly evident is that roughly 9-in-10 high-merit students enrolled in less selective private not-for-profit institutions received institutional aid, regardless of their financial need. Among low-merit and middle-merit students, on the other hand, institutional aid receipt increased with financial need.

In very selective private not-for-profit institutions, the likelihood of receiving institutional grant aid was associated with students' financial need, even among high-merit students: as their financial need increased, so did their likelihood of receiving institutional grant aid from 20 percent of low-need, to 57 percent of moderate-need, to 64 percent of high-need students. A similar pattern occurred for middle-merit students, but there were two few low-merit students to reliably report their financial need.

## Amount of Institutional Aid Received

In table 7b, the amount of institutional aid as a percent of tuition is displayed for institutional grant aid recipients, by academic merit (columns) and financial need (rows), within sector and institution selectivity. Because tuition and fees are generally lower at less selective institutions than at very selective institutions,[11] institutional aid amounts were calculated as a percent of tuition to make the amounts of aid awarded comparable. (The corresponding actual amounts are shown in table 7c.) For example, full-time students in public less-selective institutions received enough institutional grant aid, on average, to cover about three-quarters of their tuition, while those in very selective institutions received enough aid to cover about 81 percent of their tuition (table 7b). The difference in the amount of aid as a percent of tuition is not statistically significant, however, as is evident in table 7c, the total amount of average aid awarded is necessarily higher in very selective institutions ($3,400 vs. $2,200) because of higher tuition.

The following sections discuss aid amounts only as a percent of tuition. The patterns of institutional grant aid amounts that full-time aid recipients received as a percent of tuition in relation to their academic merit and financial need were not as clear as they were for the likelihood of receiving institutional aid.

[11] For example, the average tuition at public less selective institutions for full-time students was $3,100, compared with $5,200 for those in very selective institutions (BPS Data Analysis System).

**Table 7b. Among 1995–96 beginning full-time students in 4-year institutions who received institutional grant aid, the average amount received as a percentage of tuition, by financial need within high school academic merit levels**

| Financial need | All aid recipients | Academic merit index[1] | | |
|---|---|---|---|---|
| | | Low | Middle | High |
| | | Public | | |
| | | *Less selective*[2] | | |
| Total | 75.0 | 81.4 | 64.2 | 83.9 |
| Student financial need[3] | | | | |
| No need | 78.9 | ‡ | 66.9 | 98.3 |
| Moderate (less than $6,000) | 67.0 | 75.9 | 62.3 | 63.6 |
| High ($6,000 or more) | 83.5 | 92.5 | 66.0 | 95.8 |
| | | *Very selective*[2] | | |
| Total | 81.2 | 91.7 | 81.7 | 79.3 |
| Student financial need[3] | | | | |
| No need | 65.3 | ‡ | ‡ | 64.3 |
| Moderate (less than $6,000) | 66.5 | ‡ | ‡ | ‡ |
| High ($6,000 or more) | 81.9 | ‡ | 74.9 | 82.3 |
| | | Private not-for-profit | | |
| | | *Less selective*[2] | | |
| Total | 39.1 | 33.0 | 40.0 | 45.6 |
| Student financial need[3] | | | | |
| Low (less than $4,000) | 32.0 | 22.5 | 31.7 | 41.1 |
| Moderate ($4,000–15,500) | 39.7 | 34.5 | 40.9 | 45.8 |
| High (more than $15,500) | 45.2 | 39.1 | 45.1 | 51.4 |
| | | *Very selective*[2] | | |
| Total | 55.6 | 54.4 | 50.7 | 58.3 |
| Student financial need[3] | | | | |
| Low (less than $4,000) | 41.7 | ‡ | ‡ | 49.0 |
| Moderate ($4,000–15,500) | 44.4 | ‡ | 39.2 | 48.1 |
| High (more than $15,500) | 63.4 | ‡ | 62.0 | 64.4 |

‡Reporting standards not met (too few cases).

[1]Based on a composite index of SAT score, high school academic curriculum, and high school grades (see appendix A for details).

[2]Very selective institutions are those in which at least 75 percent of entering students scored above 1000 on the SAT exam. Less selective institutions are all others.

[3]Need is defined as the amount remaining after the Expected Family Contribution (EFC) and federal and state grants are subtracted from the total student budget.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1995/96 Beginning Postsecondary Students Longitudinal Study, "First Follow-up" (BPS:96/98).

**Table 7c. Among 1995–96 beginning full-time students in 4-year institutions who received institutional grant aid, the average amount received, by financial need within high school academic merit levels**

| Financial need | All aid recipients | Academic merit index[1] | | |
|---|---|---|---|---|
| | | Low | Middle | High |
| | | Public | | |
| | | *Less selective*[2] | | |
| Total | $2,211 | $2,404 | $1,742 | $2,674 |
| Student financial need[3] | | | | |
| No need | 2,071 | ‡ | 1,565 | 2,742 |
| Moderate (less than $6,000) | 1,827 | 2,140 | 1,611 | 1,784 |
| High ($6,000 or more) | 2,913 | 2,975 | 2,167 | 3,810 |
| | | *Very selective*[2] | | |
| Total | 3,372 | 4,092 | 3,201 | 3,383 |
| Student financial need[3] | | | | |
| No need | 2,454 | ‡ | ‡ | 2,474 |
| Moderate (less than $6,000) | 2,246 | ‡ | ‡ | ‡ |
| High ($6,000 or more) | 4,046 | ‡ | 3,852 | 4,004 |
| | | Private not-for-profit | | |
| | | *Less selective*[2] | | |
| Total | $4,383 | $3,198 | $4,555 | $5,698 |
| Student financial need[3] | | | | |
| Low (less than $4,000) | 3,210 | 1,757 | 3,278 | 4,427 |
| Moderate ($4,000–15,500) | 4,234 | 3,187 | 4,407 | 5,610 |
| High (more than $15,500) | 6,661 | 5,592 | 6,534 | 7,965 |
| | | *Very selective*[2] | | |
| Total | 9,231 | 8,634 | 8,005 | 9,931 |
| Student financial need[3] | | | | |
| Low (less than $4,000) | 5,089 | ‡ | ‡ | 6,189 |
| Moderate ($4,000–15,500) | 6,372 | ‡ | 5,866 | 6,739 |
| High (more than $15,500) | 11,436 | ‡ | 10,375 | 12,031 |

‡Reporting standards not met (too few cases).

[1]Based on a composite index of SAT score, high school academic curriculum, and high school grades (see appendix A for details).

[2]Very selective institutions are those in which at least 75 percent of entering students scored above 1000 on the SAT exam. Less selective institutions are all others.

[3]Need is defined as the amount remaining after the Expected Family Contribution (EFC) and federal and state grants are subtracted from the total student budget.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1995/96 Beginning Postsecondary Students Longitudinal Study, "First Follow-up" (BPS:96/98).

### *Public Institutions*

The average amount of institutional aid awarded as a percent of tuition at public institutions ranged from about two-thirds to nearly 100 percent (table 7b). However, the amounts tended to vary widely within given levels of merit and need. Therefore, only two statistical differences in amounts awarded could be detected in relation to students' financial need or academic merit. Both differences were determined for students enrolled in less selective institutions: among all aid recipients, those with high financial need received more aid as a percent of tuition (84 percent) than those with moderate need (67 percent). This difference was due primarily to the difference in aid amounts awarded to high-merit students, among whom, those with high financial need received enough aid to pay for 96 percent of their tuition, while those with moderate need received enough to pay for 64 percent of their tuition.

### *Private Not-for-Profit Institutions*

In private-not-for-profit institutions, institutional aid recipients in very selective institutions received higher amounts of aid as a percent of tuition (56 percent) than their counterparts in less selective institutions (39 percent) (table 7b). This difference was determined within each merit group. For example, among high-merit students, those in very selective institutions received enough aid to cover 58 percent of their tuition, while those in less selective institutions received enough to cover 46 percent of their tuition.

Examining amounts of institutional grant aid in relation to recipients' financial need revealed two differences that could be detected: among high-merit students in very selective institutions, high-need students received more aid (64 percent of tuition) than those with either moderate or low need (48 and 49 percent of tuition, respectively).

## Summary

Among 1995–96 full-time beginning undergraduates in public institutions, about one-quarter of students in both less selective and very selective institutions received institutional grant aid. However, high-merit students were more likely to receive institutional grant aid in less selective than in very selective institutions, while the opposite was observed for low-merit students. Among students attending public sector institutions, as students' financial need rose,[12] so did their likelihood of receiving institutional grant aid. However, students with no financial need were more likely to receive institutional grant aid in less selective institutions than in very selective institutions, while the opposite was observed for high-need students. Due to large

[12]Need defined in this study is student budget after EFC and federal and state grants are subtracted.

standard errors, differences in the amounts of aid received in relation to financial need were difficult to detect.

In private not-for-profit institutions, those in less selective institutions were more likely than their counterparts in very selective institutions to receive institutional grant aid. But among those who received aid, students in very selective institutions received higher amounts of aid as a percent of tuition than their counterparts in less selective institutions. In very selective institutions, students' financial need was associated with their likelihood of receiving aid, while in less selective institutions differences by financial need were observed for middle- and low-merit students, but not for those with high-merit. Finally, due in part to the small sample sizes of aid recipients, only in very selective private not-for-profit institutions could differences be detected in the amount of institutional aid awarded to aid recipients in relation to their financial need.

## Retention at the Awarding Institution

How did receiving institutional grant aid in their first year relate to students' likelihood of staying enrolled in the awarding institution? The analysis addressed this question at two different times, 1 year and 6 years after first enrolling. One-year retention was determined by students re-enrolling at the awarding institution in their second year. Those who did not re-enroll were distinguished by whether they transferred elsewhere or had left postsecondary education altogether. Six-year retention was determined by students attaining a degree at the awarding institution or being enrolled in 2001. In addition, the association between institutional grant aid receipt and retention is based solely on institutional grants awarded in the first year. Awards in subsequent years were not available in the BPS survey.

### First-Year Retention

This study found that some students who received institutional grant aid awards were more likely to stay enrolled in their first year and less likely to transfer to another institution than their unaided counterparts. But the findings differed by sector and also by the selectivity of the institutions. For instance, as described below, middle-merit aid recipients in less selective institutions (both public and private not-for-profit) and high-merit aid recipients in very selective public institutions were more likely to stay enrolled in their first year than their unaided counterparts with comparable merit.

#### *Public Institutions*

In less selective public institutions, both middle-merit and low-merit students who received institutional grant aid were more likely than their unaided counterparts to stay enrolled in their first year and less likely to have left postsecondary education (table 8a). For example, among middle-merit students, 87 percent of those who received aid had enrolled in their second year, compared with 75 percent of their unaided counterparts. The same pattern was not detected for high-merit students who attended less selective public institutions.

In very selective public institutions, only high-merit aid recipients were more likely than their unaided counterparts to stay enrolled (97 percent vs. 90 percent); no difference in their transfer rates, however, could be detected statistically (3 percent and 7 percent, respectively).

**Table 8a. Percentage distribution of 1995–96 beginning full-time students in public 4-year institutions according to their enrollment status after their first year, by institutional grant aid receipt, high school academic merit, and financial need**

| Academic merit index and financial need | Received aid | | | Did not receive aid | | |
|---|---|---|---|---|---|---|
| | Still enrolled | Transferred | Stopped out or left | Still enrolled | Transferred | Stopped out or left |
| | | | Public | | | |
| | | | *Less selective*[1] | | | |
| Total | 84.9 | 8.9 | 6.2 | 75.3 | 14.7 | 10.0 |
| Academic merit index[2] | | | | | | |
| Low | 81.6 | 13.7 | 4.7 | 71.6 | 17.0 | 11.4 |
| Middle | 86.5 | 9.3 | 4.2 | 75.2 | 15.1 | 9.6 |
| High | 85.7 | 5.7 | 8.6 | 87.8 | 8.4 | 3.9 |
| Student financial need[3] | | | | | | |
| No need | 88.5 | 9.9 | 1.6 | 79.5 | 13.9 | 6.6 |
| Moderate (less than $6,000) | 80.2 | 8.5 | 11.2 | 73.2 | 13.3 | 13.5 |
| High ($6,000 or more) | 91.8 | 6.2 | 2.0 | 76.3 | 15.9 | 7.8 |
| | | | *Very selective*[1] | | | |
| Total | 91.8 | 7.8 | 0.4 | 89.8 | 7.2 | 3.1 |
| Academic merit index[2] | | | | | | |
| Low | ‡ | ‡ | ‡ | 80.4 | 12.3 | 7.3 |
| Middle | 83.7 | 15.3 | 1.0 | 91.1 | 6.5 | 2.4 |
| High | 97.4 | 2.6 | # | 89.5 | 7.2 | 3.3 |
| Student financial need[3] | | | | | | |
| No need | 96.2 | 3.8 | # | 90.5 | 5.6 | 3.9 |
| Moderate (less than $6,000) | 84.7 | 13.4 | 1.9 | 89.1 | 8.0 | 2.9 |
| High ($6,000 or more) | 96.8 | 3.2 | # | 91.1 | 7.5 | 1.4 |

#Rounds to zero.

‡Reporting standards not met (too few cases).

[1]Very selective institutions are those in which at least 75 percent of entering students scored above 1000 on the SAT exam. Less selective institutions are all others.

[2]Based on a composite index of SAT score, high school academic curriculum, and high school grades (see appendix A for details).

[3]Need is defined as the amount remaining after the Expected Family Contribution (EFC) and federal and state grants are subtracted from the total student budget.

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1995/96 Beginning Postsecondary Students Longitudinal Study, "First Follow-up" (BPS:96/98).

Differences between aided and unaided students could not be detected for middle-merit students, and too few low-merit students received institutional aid in very selective institutions to determine reliable estimates of retention.

### *Private Not-for-Profit Institutions*

As in less selective public institutions, middle-merit students in less selective private not-for-profit institutions who received institutional grant aid were more likely than their unaided counterparts to stay enrolled (87 vs. 70 percent) in their first year and less likely to transfer (11 vs. 27 percent) (table 8b). Paradoxically, low-merit aid recipients in these institutions were *less* likely to stay enrolled (62 vs. 82 percent) and more likely to transfer (24 vs. 12 percent) than their unaided counterparts. It is not clear why this would occur.

In very selective private not-for-profit institutions, small sample sizes made it difficult to determine differences in 1-year retention rates between aided and unaided students. While it appears as though high-merit aid recipients were more likely to stay enrolled than their unaided counterparts (88 vs. 81 percent), and that middle-merit aid recipients were less likely to leave postsecondary education than their unaided counterparts (less than 1 percent vs. 11 percent), there was not enough statistical evidence to confirm the differences. There were too few low-merit students who received institutional aid to report estimates.

## Degree Attainment and Retention 6 Years Later

When examining the likelihood of students either attaining a degree from or still being enrolled at the awarding institution 6 years later, the findings revealed that certain students who received institutional aid in their first year were more likely than their unaided counterparts to have maintained their enrollment or earned a degree at the awarding institution. As was found for first-year retention, the results differed according to sector and selectivity.

### *Public Institutions*

In less selective public institutions, all aided students (whether low-, middle-, or high-merit) were more likely than their unaided counterparts to have attained a degree or to still be enrolled at the awarding institution (table 9a). In total, about two-thirds of aided students, compared with one-half of unaided students had done so. In very selective public institutions, on the other hand, this pattern was found only for high-merit students (88 vs. 78 percent).

**Table 8b. Percentage distribution of 1995–96 beginning full-time students in private not-for-profit 4-year institutions according to their enrollment status after their first year, by institutional grant aid receipt, high school academic merit, and financial need**

| Academic merit index and financial need | Received aid | | | Did not receive aid | | |
|---|---|---|---|---|---|---|
| | Still enrolled | Transferred | Stopped out or left | Still enrolled | Transferred | Stopped out or left |
| | | | Private not-for-profit | | | |
| | | | *Less selective*[1] | | | |
| Total | 78.4 | 14.9 | 6.7 | 74.0 | 16.8 | 9.2 |
| Academic merit index[2] | | | | | | |
| Low | 62.4 | 23.9 | 13.7 | 81.6 | 11.8 | 6.5 |
| Middle | 87.2 | 10.6 | 2.1 | 70.3 | 26.7 | 3.0 |
| High | 86.4 | 12.4 | 1.1 | 94.6 | 3.7 | 1.7 |
| Student financial need[3] | | | | | | |
| No need | 71.5 | 19.5 | 9.0 | 72.6 | 20.3 | 7.2 |
| Moderate (less than $6,000) | 78.4 | 14.3 | 7.2 | 72.4 | 16.1 | 11.5 |
| High ($6,000 or more) | 91.9 | 6.4 | 1.7 | 88.9 | 5.4 | 5.8 |
| | | | *Very selective*[1] | | | |
| Total | 87.8 | 11.5 | 0.8 | 79.9 | 12.7 | 7.4 |
| Academic merit index[2] | | | | | | |
| Low | ‡ | ‡ | ‡ | ‡ | ‡ | ‡ |
| Middle | 85.7 | 14.4 | # | 80.9 | 8.2 | 10.9 |
| High | 88.3 | 10.5 | 1.2 | 80.7 | 12.7 | 6.6 |
| Student financial need[3] | | | | | | |
| No need | 93.1 | 7.0 | # | 78.5 | 10.2 | 11.4 |
| Moderate (less than $6,000) | 79.0 | 20.1 | 0.9 | 79.1 | 11.3 | 9.6 |
| High ($6,000 or more) | 92.2 | 7.1 | 0.7 | 85.9 | 13.6 | 0.5 |

#Rounds to zero

‡Reporting standards not met (too few cases).

[1]Very selective institutions are those in which at least 75 percent of entering students scored above 1000 on the SAT exam. Less selective institutions are all others.

[2]Based on a composite index of SAT score, high school academic curriculum, and high school grades (see appendix A for details).

[3]Need is defined as the amount remaining after the Expected Family Contribution (EFC) and federal and state grants are subtracted from the total student budget.

NOTE: Detail may not sum to totals because of rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1995/96 Beginning Postsecondary Students Longitudinal Study, "First Follow-up" (BPS:96/98).

**Table 9a. Percentage of 1995–96 beginning full-time students in public 4-year institutions who were enrolled at or had attained a degree from their first institution by 2001, by institutional grant aid receipt, high school academic merit, and financial need**

| Financial need | Received aid | | | | Did not receive aid | | | |
|---|---|---|---|---|---|---|---|---|
| | All students | Low merit | Middle merit | High merit | All students | Low merit | Middle merit | High merit |
| | | | | Public | | | | |
| | | | | *Less selective*[1] | | | | |
| Total | 67.1 | 52.3 | 70.6 | 81.6 | 49.8 | 41.1 | 55.3 | 69.1 |
| Student financial need[2] | | | | | | | | |
| No need | 74.0 | ‡ | 65.9 | 87.8 | 55.0 | 45.0 | 60.6 | 64.3 |
| Moderate (less than $6,000) | 65.7 | 53.2 | 69.3 | 83.5 | 46.8 | 37.3 | 52.2 | 72.2 |
| High ($6,000 or more) | 65.9 | 51.3 | 79.0 | 72.4 | 50.2 | 45.8 | 54.7 | ‡ |
| | | | | *Very selective*[1] | | | | |
| Total | 81.3 | ‡ | 72.7 | 88.1 | 76.9 | 52.2 | 78.9 | 78.0 |
| Student financial need[2] | | | | | | | | |
| No need | 95.1 | ‡ | ‡ | 96.7 | 78.7 | ‡ | 80.2 | 79.8 |
| Moderate (less than $6,000) | 80.3 | ‡ | ‡ | ‡ | 73.1 | ‡ | 72.9 | 78.0 |
| High ($6,000 or more) | 81.2 | ‡ | 81.8 | 81.7 | 79.5 | ‡ | 85.1 | 72.9 |

‡Reporting standards not met (too few cases).

[1]Very selective institutions are those in which at least 75 percent of entering students scored above 1000 on the SAT exam. Less selective institutions are all others.

[2]Need is defined as the amount remaining after the Expected Family Contribution (EFC) and federal and state grants are subtracted from the total student budget.

NOTE: Merit index is based on a composite index of SAT score, high school academic curriculum, and grades in high school (see appendix A for details).

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/01 Beginning Postsecondary Students Longitudinal Study, "Second Follow-up" (BPS:96/01).

When examining both merit and financial need simultaneously, small sample sizes and large standard errors precluded making some comparisons. Nevertheless, several patterns were detected. For example, in less selective public institutions, middle-merit aided students with moderate or high financial need and low-merit students with moderate need were more likely than their unaided counterparts to have attained a degree from, or to be enrolled at, the awarding institution 6 years after first starting. Specifically, 69 percent of middle-merit students with moderate financial need were enrolled or had attained a degree at the awarding institution, compared with 52 percent of their unaided counterparts. Comparable percentages for middle-merit students with high financial need are 79 and 55 percent.

At very selective public institutions, virtually all (97 percent) high-merit students with no financial need who received institutional aid had attained a degree or were enrolled 6 years later

at the awarding institution, compared with 80 percent of their unaided counterparts. While it appears as though high-merit students with high financial need also had higher retention rates than their unaided counterparts (82 vs. 73 percent), there was not enough statistical evidence to confirm the difference.

### *Private Not-for-Profit Institutions*

In private not-for-profit institutions, no differences could be detected between aided and unaided students in whether they had attained a degree from or were still enrolled at the awarding institutions (table 9b). This was found across all levels of merit in both less selective and very selective institutions. For instance, 67 percent of middle-merit students who received

**Table 9b. Percentage of 1995–96 beginning full-time students in private not-for-profit 4-year institutions who were enrolled at or had attained a degree from their first institution by 2001, by institutional grant aid receipt, high school academic merit, and financial need**

| | Received aid | | | | Did not receive aid | | | |
|---|---|---|---|---|---|---|---|---|
| Financial need | All students | Low merit | Middle merit | High merit | All students | Low merit | Middle merit | High merit |
| | | | | Private not-for-profit | | | | |
| | | | | *Less selective*[1] | | | | |
| Total | 64.0 | 53.2 | 67.3 | 77.0 | 58.0 | 51.8 | 64.9 | 75.6 |
| Student need[2] | | | | | | | | |
| Low (less than $4,000) | 58.3 | 42.5 | 65.6 | 68.4 | 65.4 | 66.6 | 70.3 | ‡ |
| Moderate ($4,000–15,500) | 64.7 | 57.1 | 66.6 | 80.4 | 52.3 | 44.6 | 60.1 | ‡ |
| High (more than $15,500) | 72.3 | 53.3 | 73.7 | 81.3 | 65.6 | ‡ | ‡ | ‡ |
| | | | | *Very selective institutions*[1] | | | | |
| Total | 78.4 | ‡ | 73.2 | 81.4 | 79.1 | ‡ | 72.7 | 85.3 |
| Student financial need[2] | | | | | | | | |
| Low (less than $4,000) | 73.6 | ‡ | ‡ | 78.5 | 80.3 | ‡ | 74.4 | 85.1 |
| Moderate ($4,000–15,500) | 79.9 | ‡ | 82.6 | 79.4 | 77.5 | ‡ | 70.0 | 86.8 |
| High (more than $15,500) | 79.5 | ‡ | 72.5 | 83.5 | 81.1 | ‡ | ‡ | 85.8 |

‡Reporting standards not met (too few cases).

[1]Very selective institutions are those in which at least 75 percent of entering students scored above 1000 on the SAT exam. Less selective institutions are all others.

[2]Need is defined as the amount remaining after the Expected Family Contribution (EFC) and federal and state grants are subtracted from the total student budget.

NOTE: Merit index is based on a composite index of SAT score, high school academic curriculum, and grades in high school (see appendix A for details).

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/01 Beginning Postsecondary Students Longitudinal Study, "Second Follow-up" (BPS:96/01).

institutional grant aid in less selective institutions had either attained a degree or were still enrolled at the awarding institution, as had 65 percent of their unaided counterparts.

Taking into account both merit and financial need, the only difference in institutional retention rates observed in the private not-for-profit sector was among low-merit students with low need at less selective institutions. As was found for 1-year retention, those receiving institutional grant aid were *less* likely than their unaided counterparts to be enrolled or have attained a degree 6 years later (42 vs. 67 percent).

## Multivariate Analysis

To take into account the interrelationship of students' academic merit, financial need, and demographic characteristics along with institutional characteristics, all of which may influence students' likelihood of completing a college degree, a multivariate analysis was conducted. (See appendix B for a detailed description of the methodology used.) In particular, the analysis examined the association between institutional grant aid amounts as a percent of tuition received in the first year and 6-year retention rates at the awarding institution, taking into account the covariation of other independent variables such as financial need and academic merit.

The main independent variable was the amount of institutional grant aid students received in their first year as a percent of tuition it covered.[13] Because the amount needed to attend private not-for-profit institutions is considerably higher than the amount needed to attend comparable public institutions, the levels of institutional aid were necessarily different for the two sectors. For public institutions, the institutional aid levels were amounts that covered either less than 50 percent or 50 percent or more of tuition. For private not-for-profit institutions, the levels were amounts that covered 25 percent or less of tuition, 26–49 percent, 50–74 percent, and 75 percent or more. However, the comparison group—those who received no institutional grant aid—was the same in both sectors. Other independent variables included levels of students' academic merit (middle and high vs. low), students' financial need (moderate and high vs. low), and institution selectivity (very selective vs. less selective). In addition, demographic and socioeconomic variables were taken into account, including gender, race/ethnicity, and parents' education.[14] Because the financial need variable takes into account both income and federal and state grant aid, no other income or financial aid variables were included in the regressions. The analysis was

[13] In subsequent follow-up surveys, the amount of institutional aid was unknown.

[14] While the analysis controlled for observable student characteristics that might be related to persistence, it is possible that unobservable characteristics are related both to the receipt of institutional aid and persistence. For example, an institution might be more likely to give aid to students it perceives as more likely to succeed over students with comparable merit and need.

done separately for public and private not-for-profit institutions and included only full-time students.

The results for the public sector are shown in table 10a. The first column displays the unadjusted percentages, which are the percentages of full-time students who attained a degree at the awarding institution or were still enrolled 6 years after first beginning, before adjusting for the covariation of the independent variables in the model. Comparisons are made between the subgroup and the reference group (in italics), and all significant differences are designated with an asterisk. The second column displays the least squares coefficients expressed as percentages. Significant coefficients represent the observed differences that remain between the analysis group (such as those receiving certain amounts of institutional aid) and the comparison group (those receiving no institutional aid) after controlling for the relationships of all the selected independent variables. For example, in table 10a, the least squares coefficient for those who received enough institutional aid to cover 50 percent or more of tuition is 14.97. This means that compared to those who received no institutional aid, about 15 percent more of the aid recipients would be expected to maintain their enrollment or attain a degree at the awarding institution after controlling for the relationships with all the other independent variables.

In public institutions, receiving institutional grant aid in the first year appeared to make a difference in whether students stayed enrolled at the awarding institution. Both levels of institutional aid amounts were related to higher 6-year retention rates, compared with receiving no institutional grant aid. That is, both those who received less than 50 percent of tuition and those who received more than that were more likely to earn a degree from or to be enrolled at the awarding institution than students who did not receive institutional aid in their first year after controlling for the relationships with the other variables.

Results for private not-for-profit institutions are shown in table 10b. It appears as though students who received amounts of institutional aid that covered 75 percent or more of their tuition were more likely than unaided students to have attained a degree from or still be enrolled at the awarding institutions. However, after taking into consideration the covariation of students' academic merit, financial need, institutional selectivity, as well as other variables, the multivariate analysis failed to find a difference between aided and unaided students, regardless of the amount that aided students received.

Other independent variables were associated with 6-year institutional retention rates in both sectors after controlling for the relationships with other variables. These variables were high school academic merit (both middle- and high-merit levels were more likely to stay enrolled than low-merit levels) and parents' education (those whose parents had no more than a high school

**Table 10a. Percentage of 1995–96 beginning full-time students in public 4-year institutions who were enrolled at or had attained a degree from their beginning institutions 6 years later and the least squares coefficients and standard errors expressed as percentages**

| Characteristic | Unadjusted percentages[1] | Least squares coefficient[2] | Standard error |
|---|---|---|---|
| | | Public | |
| Total[3] | 59.2 | 47.37 | 3.34 |
| Amount of institutional grant aid as a percent of tuition | | | |
| *No aid* | *55.4* | † | † |
| Less than 50 percent | 68.4* | 10.17* | 3.89 |
| 50 percent or more | 72.2* | 14.97* | 3.58 |
| Institution selectivity[4] | | | |
| *Less selective* | *53.9* | † | † |
| Very selective | 78.0* | 13.25* | 3.22 |
| High school academic merit[5] | | | |
| *Low merit* | *44.0* | † | † |
| Middle merit | 62.7* | 13.47* | 2.83 |
| High merit | 78.4* | 20.82* | 3.83 |
| Parents' highest level of education | | | |
| High school or less | 49.9* | -9.19* | 2.53 |
| *Attended college or higher* | *64.3* | † | † |
| Gender | | | |
| Female | 60.0 | 3.90 | 2.38 |
| *Male* | *58.2* | † | † |
| Race/ethnicity | | | |
| American Indian | ‡ | ‡ | ‡ |
| Asian | 68.4 | 1.73 | 5.25 |
| Black | 47.7* | -3.62 | 4.02 |
| Hispanic | 52.1* | -4.59 | 3.97 |
| *White* | *61.3* | † | † |
| Financial need[6] | | | |
| High need ($6,500 or more) | 62.8 | -0.98 | 3.35 |
| Moderate need (less than $6,500) | 54.2* | -3.52 | 2.87 |
| *No need* | *64.7* | † | † |

†Not applicable for the reference group.

‡Reporting standards not met (too few cases).

*$p \leq .05$.

[1]The estimates are from the BPS:96/01 Data Analysis System.

[2]Coefficients designated with an asterisk can be interpreted as the number of percentage points over or under the comparison group once the covariation of all variables is taken into account (see appendix B). For example, the coefficient for those who received enough aid to cover 50 percent or more of tuition is 14.97, which means that about 15 percent more of these aid recipients would be expected to maintain their enrollment compared to those who received no aid.

[3]The italicized group in each category is the reference group being compared.

[4]Very selective institutions are those in which at least 75 percent of entering students scored above 1000 on the SAT exam. Less selective institutions are all others.

[5]Based on a composite index of SAT score, high school academic curriculum, and grades in high school (see appendix B for details).

[6]Need is defined as the amount remaining after the Expected Family Contribution (EFC) and federal and state grants are subtracted from the total student budget.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/01 Beginning Postsecondary Students Longitudinal Study (BPS:96/01), Data Analysis System.

**Table 10b. Percentage of 1995–96 beginning full-time students in private not-for-profit 4-year institutions who were enrolled at or had attained a degree from their beginning institutions 6 years later and the least squares coefficients and standard errors expressed as percentages**

| Characteristic | Unadjusted percentages[1] | Least squares coefficient[2] | Standard error |
|---|---|---|---|
| | Private not-for-profit institutions | | |
| Total[3] | 67.5 | 54.29 | 4.35 |
| Amount of institutional grant aid as a percent of tuition | | | |
| *No aid* | *66.0* | † | † |
| Less than 50 percent | 63.7 | -0.24 | 3.12 |
| 50–74 percent | 74.4 | 4.16 | 4.18 |
| 75 percent or more | 80.4* | 8.18 | 5.24 |
| Institution selectivity[4] | | | |
| *Less selective* | *61.9* | † | † |
| Very selective | 78.8* | 3.61 | 3.50 |
| High school academic merit[5] | | | |
| *Low merit* | *52.4* | † | † |
| Middle merit | 68.2* | 11.75* | 3.58 |
| High merit | 80.9* | 20.43* | 4.11 |
| Parents' highest level of education | | | |
| High school or less | 56.3* | -9.99* | 2.91 |
| *Attended college or higher* | *71.4* | † | † |
| Gender | | | |
| Female | 68.8 | 2.39 | 2.65 |
| *Male* | *65.8* | † | † |
| Race/ethnicity | | | |
| American Indian | ‡ | ‡ | ‡ |
| Asian | 73.5 | -0.86 | 5.59 |
| Black | 56.8* | -2.61 | 4.76 |
| Hispanic | 61.2 | -5.05 | 4.51 |
| *White* | *69.3* | † | † |
| Financial need[6] | | | |
| High need (more than $16,000) | 76.7* | 4.63 | 4.04 |
| Moderate need ($4,500–16,000) | 64.3 | 1.86 | 3.30 |
| *Low need (less than $4,500)* | *66.9* | † | † |

†Not applicable for the reference group.

‡Reporting standards not met (too few cases).

*$p \leq .05$.

[1]The estimates are from the BPS:96/01 Data Analysis System.

[2]Coefficients designated with an asterisk can be interpreted as the number of percentage points over or under the comparison group once the covariation of all variables is taken into account (see appendix B). For example, the coefficient for high-merit students is 20.43, which means that about 20 percent more high-merit students would be expected to maintain their enrollment compared to low-merit students.

[3]The italicized group in each category is the reference group being compared.

[4]Very selective institutions are those in which at least 75 percent of entering students score above 1000 on the SAT exam. Less selective institutions are all others.

[5]Based on a composite index of SAT score, high school academic curriculum, and grades in high school (see appendix B for details).

[6]Need is defined as the amount remaining after the Expected Family Contribution (EFC) and federal and state grants are subtracted from the total student budget.

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1996/01 Beginning Postsecondary Students Longitudinal Study (BPS:96/01), Data Analysis System.

education were less likely to stay enrolled than students whose parents attended college). In the public sector, selectivity was also associated with institutional retention, but the same was not observed in private not-for-profit institutions. That is, in public colleges and universities, students in very selective institutions were more likely to stay enrolled than those in less selective institutions, while in the private not-for-profit sector, no differences in retention rates were detected between those in very selective and less selective institutions after taking into account the covariation of related variables.

Finally, in both analyses, once related variables were taken into consideration, no differences in retention rates could be detected between aided and unaided students with respect to their gender, race/ethnicity, or levels of financial need.

## Summary and Conclusions

Using data from three administrations of the National Postsecondary Student Aid Study (NPSAS:92, NPSAS:96, and NPSAS:2000), the analysis revealed a measurable increase in the percentage of full-time undergraduates in 4-year colleges and universities who received institutional aid over the last decade. In private not-for-profit institutions, increases in merit aid were especially notable over the latter period (between 1995–96 and 1999–2000), in particular for students in the highest income quartile. In 1995–96, 18 percent of high-income students in private not-for-profit institutions received an average of about $4,800 in institutional merit aid, while in 1999–2000, 29 percent received an average of $5,900. Corresponding estimates for low-income students were 18 and 23 percent, respectively, who received merit aid, averaging roughly $4,300 and $4,100.

The findings for private not-for-profit institutions also indicate that there may have been a shift away from favoring middle-income students with merit aid toward awarding comparable proportions of aid to middle- and high-income students. Specifically, in 1992–93 and 1995–96, middle-income students were more likely to receive merit aid than either low- or high-income students. By 1999–2000, no difference could be detected in the percentage of middle- and high-income students receiving merit aid—32 and 29 percent, respectively, did so—compared with 23 percent of low-income students.

Even though students in private not-for-profit institutions are the main recipients of institutional aid—nearly 60 percent of full-time students received such aid in 1999–2000—nearly one-quarter of their counterparts in public institutions also received institutional aid that year. Moreover, the percentage receiving merit-based aid increased from 7 percent to 10 percent between 1995–96 and 1999–2000. However, the likelihood of receiving merit aid in public institutions was not associated with family income in any of the three surveys analyzed.

The study also analyzed data from a cohort of undergraduates who first enrolled in college in 1995–96 to determine how the receipt of institutional grant aid was related to students' high school academic merit, their financial need, and the institutions' selectivity. The data were further analyzed to ascertain whether institutional grant aid was related to students' likelihood of staying enrolled in the awarding institution.

There were notable differences in the extent to which less selective and very selective institutions awarded institutional grant aid. Students who had achieved high academic merit in high school were much more likely to receive institutional grant aid in less selective institutions than in very selective institutions. This pattern was observed in both public and private not-for-profit institutions, though the percentages receiving aid were higher in the private sector. Roughly 9-in-10 high-merit students in less selective private not-for-profit institutions received institutional grant aid in 1995–96, with no differences detected across income quartiles. In very selective institutions, on the other hand, high-merit students with high financial need were much more likely to receive institutional grant aid than their counterparts with low (or no) financial need.

The analysis also produced evidence that the receipt of institutional grant aid in less selective institutions was related to higher 1-year college retention rates for some students, particularly for those who had achieved moderate levels of high school academic merit. These students were more likely to return to the awarding institution in their second year than students with comparable merit who did not receive institutional grant aid. This finding held in both public and private not-for-profit sectors. In very selective institutions, on the other hand, a difference in 1-year retention rates between aided and unaided students could only be detected for high-merit students in public institutions.

The analysis also detected an association between receiving institutional grant aid in their first year and the likelihood of students either attaining a degree from or being enrolled in the awarding institution 6 years later in public institutions. This was particularly the case for middle-merit students with moderate and high levels of financial need. In other words, those who received institutional grants in public institutions in their first year were more likely than their unaided counterparts to earn a degree from or still be enrolled in the awarding institution. Similar results, however, could not be detected for those enrolled in private not-for-profit institutions.

The findings for long-term retention rates of students at the awarding institution also held in a multivariate analysis, which took into account the intercorrelation of related variables such as students' academic merit, financial need, and demographic characteristics and the selectivity of institutions. In other words, students in public institutions who received institutional aid in their first year were more likely than their unaided counterparts to receive a degree from or still be enrolled in the awarding institution 6 years after their initial enrollment even after taking into consideration these variables. The same was not detected for those in private not-for-profit institutions.

Taken together, the results are consistent with those of other studies reporting increases in spending by 4-year colleges and universities on institutional aid (e.g., Cunningham et al. 2001), especially by less selective institutions (Redd 2000; Hubbell and Lapovsky 2002). The findings also indicated that in the late 1990s, the percentage of high-income students receiving institutional grant aid increased, as did the average amount they received. This study could not address whether institutional grant aid awards had increased the enrollment of the types of students that institutions sought. However, the findings did indicate that in private not-for-profit institutions, where most institutional grant aid is awarded, no obvious association could be detected between students' receipt of institutional grant aid in their first year and their persistence at the awarding institution until degree attainment, once other factors such as students' academic merit, their financial need, and institutional selectivity were taken into consideration.

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# Appendix A—Glossary

This glossary describes the variables used in this report. The items were taken directly from the NCES NPSAS:93, NPSAS:96, NPSAS:2000, BPS:96/98, and BPS:96/2001 undergraduate Data Analysis Systems (DAS), software applications that generate tables from the survey data (see appendix B for a description). The variables listed in the index below are organized by data set and the section in which they first appear in the report. If the variable names are different in the different survey years, all variable names are listed. The glossary is in alphabetical order by descriptive label for each data set (i.e., "income quartiles"). Variables from NPSAS are listed first, followed by those from BPS.

## Glossary Index


NPSAS VARIABLES

**Trends in Institutional Grant Aid Receipt: 1992–93 to 1999–2000**

Attendance intensity ..... ATTEND
Dependency status ..... DEPEND
Gender ..... GENDER
Grade-point average ..... GPA (1993)
GPA2 (1996, 2000)
Income quartiles ..... PCTALL (1993)
PCTALL2 (1996, 2000)
Institutional aid ..... INSTAMT
Institutional merit-based grants ..... INSTNOND (1993)
INSMERIT (1996, 2000)
Institutional need-based aid ..... INSTNEED (1993, 2000)
INSTNDR (1996)
Institutional type ..... SECTOR_B (1993)
SECTOR9 (1996, 2000)
Tuition and fees ..... TUITION (1993, 1996)
TUITION2 (2000)

BPS VARIABLES

**Data and Key Variables**

Attendance intensity ..... ATTEND2
Derived SAT combined score ..... TESATDER
Financial need ..... SNEED7
Grades in high school ..... HCGPADER
High school academic curriculum ..... CTAKING
High school academic merit index ..... MERITNDX
Income quartiles ..... PCTALL2
Institution control ..... CONTROL
Institution level ..... ITNPLV
Institution selectivity ..... INSTSEL

**Academic Merit, Financial Need, and Institutional Grant Aid Among Beginning Students in 1995–96**

Institutional aid ..... INSTAMT
Institutional grant ..... INGRTAMT
Institutional grant aid as a percentage of tuition ..... INGTNPCT
Institutional merit-based grants ..... INSTNOND
Institutional need-based grants/ scholarships ..... INSTNEED

**Retention at the Awarding Institution**

Enrollment status after first year ..... PRFIRST
Enrollment/attainment status: 2001 ..... PROUFIY6
Gender ..... SBGENDER
Parents' highest level of education ..... PAREDUC
Race/ethnicity ..... SBRACE

***DAS Variable***

## NPSAS VARIABLES

***Attendance intensity*** **ATTEND**

Student's attendance status during the fall (September or October) of 1992 (NPSAS:93), 1995 (NPSAS:96), or 1999 (NPSAS:2000). This variable was used to exclude students who did not attend full time.

***Dependency status*** **DEPEND**

Students were considered to be independent if they met any of the following criteria:

1) Student was 24 years old or older as of 12/31 in 1992 (for NPSAS:93), 1995 (NPSAS:96), or 1999 (for NPSAS:2000);
2) Student was a veteran of the U.S. Armed Forces;
3) Student was enrolled in a graduate or professional program (beyond a bachelor's degree);
4) Student was married;
5) Student was an orphan or ward of the court; or
6) Student had legal dependents other than spouse.

Dependent
Independent

***Gender of student*** **GENDER**

Male
Female

***Grade-point average*** **GPA (1993); GPA2 (1996, 2000)**

Student's cumulative grade-point average (GPA) at the sampled NPSAS institution. The GPA was standardized to a 4.00-point scale.

Less than 2.00
2.00–3.49
3.50 or higher

***Institutional aid*** **INSTAMT**

Indicates the total institutional aid amount received in 1992–93 (for NPSAS:93), 1995–96 (NPSAS:96), or 1999–2000 (for NPSAS:2000). Equal to the sum of institutional grants and fellowships, loans, institution-sponsored work-study, and all other institutional amounts including assistantships. The 1993 and 1996 amounts were converted to 1999 dollars using the Consumer Price Index.

***Institutional need-based aid*** **INSTNEED (1993, 2000); INSTNDR (1996)**

Amount of institutional grants that were based entirely on need or partly on need and partly on merit. Equal to total amount of institutional grants, minus the amount of institutional grants that were based entirely on merit.

***DAS Variable***

***Institutional merit-based grants*** **INSTNOND (1993); INSMERIT (1996, 2000)**

Institutional merit-only grants and scholarships. Includes all athletic scholarships. Merit-only scholarships are not based on need, but they may be awarded to students who also qualify for need-based aid. The 1993 and 1996 amounts were converted to 1999 dollars using the Consumer Price Index.

***Income quartiles***

Income percentile rank. Equal to the proportion of the sample who had an income lower than that recorded for the student in question. Percentiles were calculated separately for dependent and independent students and then combined into one variable. Each ranking compares the student only to other students of the same dependency status. Parents' income is used if student is dependent, and student's own income is used if student is independent. Total income in 1991 was used for NPSAS:93, income in 1994 was used for NPSAS:96, and income in 1998 was used for NPSAS:2000. The income from these years is what was reported on the financial aid applications and used for federal need analysis. The amounts shown for all years are in real dollars.

***NPSAS:93*** **PCTALL (1993)**

Dependent students
- 0–24 (Less than $27,000)
- 25–49 ($27,000 to $44,999)
- 50–74 ($45,000 to $59,999)
- 75–100 ($60,000 or more)

Independent students
- 0–24 (Less than $10,000)
- 25–49 ($10,000 to $20,999)
- 50–74 ($21,000 to $35,499)
- 75–100 ($35,500 or more)

***NPSAS:96*** **PCTALL2 (1996)**

Dependent students
- 0–24 (Less than $24,000)[15]
- 25–49 ($24,000 to $46,499)
- 50–74 ($46,500 to $69,999)
- 75–100 ($70,000 or more)

Independent students
- 0–24 (Less than $8,000)
- 25–49 ($8,000 to $18,999)
- 50–74 ($19,000 to $34,999)
- 75–100 ($35,000 or more)

[15]For students who do not apply for federal financial aid (roughly one-half), incomes are based on student estimates or imputations. The income imputation procedure used in NPSAS:93 was different from the procedure used in subsequent NPSAS surveys. This difference may account for the apparent decrease in the threshold for the lowest income quartile between NPSAS:93 and NPSAS:96.

| *NPSAS:2000* | *DAS Variable* PCTALL2 |
|---|---|
| Dependent students | |
| 0–24 (Less than $31,000) | |
| 25–49 ($31,000 to $53,999) | |
| 50–74 ($54,000 to $82,999) | |
| 75–100 ($83,000 or more) | |
| Independent students | |
| 0–24 (Less than $12,000) | |
| 25–49 ($12,000 to $25,999) | |
| 50–74 ($26,000 to $47,999) | |
| 75–100 ($48,000 or more) | |

***Institutional type*** **SECTOR_B (1993); SECTOR9 (1996, 2000)**

Type of 4-year institution, by control. Institution control concerns the source of revenue and control of operations. Less-than-4-year institutions and private for-profit institutions were excluded from this analysis. For a definition of 4-year institutions, see BPS definition for *Institution level.*

| | |
|---|---|
| Public | A postsecondary education institution that is supported primarily by public funds and operated by publicly elected or appointed officials who control the programs and activities. |
| Private not-for-profit | A postsecondary education institution that is controlled by an independent governing board and incorporated under Section 501(c)(3) of the Internal Revenue Code |

***Tuition and fees*** **TUITION (1993, 1996); TUITION2 (2000)**

Tuition and fees charged full-time, full-year students at the sampled NPSAS institution for students who attended only one institution. The 1993 and 1996 amounts were adjusted to 1999 dollars using the Consumer Price Index.

***DAS Variable***

**BPS VARIABLES**

***Attendance intensity*** **ATTEND2**

Indicates the student's attendance status during the fall or during the first month enrolled after October 1995. Excludes students enrolled during the summer of 1995. This variable was used to exclude students who did not attend full time.

***Institution control*** **CONTROL**

See corresponding NPSAS definition for *Institution type*.

***High school academic curriculum*** **CTAKING**

Ranks the rigor of student's high school coursetaking. Applies to respondents who took the SAT or ACT examinations.

| | |
|---|---|
| Core or below | Met New Basics curriculum standards or less: 4 years of English and 3 years each of social science, mathematics, and science. |
| Mid-level | Had a minimum curriculum of 4 years of English; 1 year of foreign language; 3 years each of mathematics and science; and had taken two of the following: biology, chemistry, and physics. |
| Rigorous | Had a minimum curriculum of 4 years each of English and mathematics; 3 years each of foreign language, science, and social science; one AP or honors class or AP test score in any subject; and had taken all of the following: precalculus, biology, chemistry, and physics. |

***Grades in high school*** **HCGPADER**

The weighted average of grades in the five subject areas (English, mathematics, foreign languages, science, and social studies), according to self-report on standardized test questionnaire.

B- to B or lower
As and Bs
A- to A

***Institutional grant*** **INGRTAMT**

Institutional grant aid received during 1995–96. Includes all grants and scholarships, tuition waivers, and graduate fellowships received during the NPSAS year.

***Institutional grant aid as a percentage of tuition*** **INGTNPCT**

Institutional grant aid as a percentage of tuition and fees in 1995–96. Institutional grants may cover other educational expenses as well as tuition and fees, resulting in values over 100 percent.

***DAS Variable***

***Institutional aid*** **INSTAMT**

See corresponding NPSAS definition.

***Institutional need-based grants/scholarships*** **INSTNEED**

See corresponding NPSAS definition.

***Institutional merit-based grants*** **INSTNOND**

See corresponding NPSAS definition.

***Institution selectivity*** **INSTSEL**

"Very selective" identifies institutions in which the 25th percentile of SAT I and ACT scores of freshmen entering in fall 1997 was greater than 1000. The variable was obtained from the College Board Survey of the same year. The remaining institutions were categorized as "Less selective."

| | |
|---|---|
| Very selective | The institutions in which the 25th percentile of SAT/ACT scores of incoming freshman exceeded 1000. |
| Less selective | All other 4-year institutions. |

***Institution level*** **ITNPLV**

Level of the first institution attended in 1995–96. Less-than-4-year institutions were excluded from this analysis.

| | |
|---|---|
| 4-year | Denotes 4-year institutions that can award bachelor's degrees or higher, including institutions that award doctorate degrees and first-professional degrees. These include chiropractic, pharmacy, dentistry, podiatry, medicine, veterinary medicine, optometry, law, osteopathic medicine, and theology. |

***High school academic merit index*** **MERITNDX**

An index of high school academic merit based on SAT or equivalent ACT scores, rigor of high school curriculum, and high school GPA. The index was empirically determined based in large part on the selectivity of the college where the student first enrolled.

Low merit
Middle merit
Middle to high merit
High merit

In the analysis, the two middle groups were combined.

***DAS Variable***

***Parents' highest level of education*** **PAREDUC**

Indicates parent's highest level of education. Equal to maximum of highest level of education completed by father and highest level of education completed by mother.

High school or less
Attended college or higher

***Income quartiles*** **PCTALL2**

See corresponding NPSAS definition.

***Enrollment status after first year*** **PRFIRST**

Indicates the enrollment status of beginning students after their first year of enrollment (1995–96) in relation to the first institution attended.

| | |
|---|---|
| Still enrolled | Beginners who returned to the first institution attended in the second year. |
| Transferred | Beginners who transferred out of the first institution attended and enrolled in another institution before the start of the second year. |
| Stopped out or left | Beginners who did not return to the first institution in the second year. Includes those who did return in the third year, as well as those who transferred elsewhere by the end of the third year, or otherwise had not returned to the first institution. |

***Enrollment/attainment status: 2001*** **PROUFIY6**

Enrollment or attainment at first institution at the end of academic year 2000–01. This includes students who were enrolled at or had attained a bachelor's degree, associate's degree, or certificate from their beginning institution.

***Gender*** **SBGENDER**

Male
Female

***DAS Variable***

***Race/ethnicity*** **SBRACE**

Student's race/ethnicity.

| | |
|---|---|
| White, non-Hispanic | A person having origins in any of the original peoples of Europe, North Africa, or the Middle East. |
| Black, non-Hispanic | A person having origins in any of the black racial groups of Africa. |
| Hispanic | A person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race. |
| Asian/Pacific Islander | A person having origins in any of the peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands. This includes people from China, Japan, Korea, the Philippine Islands, India, Vietnam, Hawaii, and Samoa. |
| American Indian/Alaska Native | A person having origins in any of the original peoples of North America and who maintains cultural identification through tribal affiliation or community recognition. |

***Financial need*** **SNEED7**

Indicates adjusted student budget minus EFC and federal and state grants. Negative values recoded to zero. Does not apply to students attending more than one institution. Need was calculated separately for students attending public and private not-for-profit institutions. Applies only to the first year.

Public
- No need
- Moderate need (less than $6,000)
- High need ($6,000 or more)

Private not-for-profit
- Low need (less than $4,000)
- Moderate need ($4,000–15,500)
- High need (more than $15,500)

***Derived SAT combined score*** **TESATDER**

SAT combined score, derived as either the sum of the SAT verbal and mathematics scores or the ACT composite score converted to an estimated SAT combined score.

# Appendix B—Technical Notes

## The National Postsecondary Student Aid Study

The National Postsecondary Student Aid Study (NPSAS) is a comprehensive nationwide study conducted by the U.S. Department of Education's National Center for Education Statistics (NCES) to determine how students and their families pay for postsecondary education.[16] It also describes demographic and other characteristics of students enrolled. The NPSAS study is based on a nationally representative sample of all students in postsecondary education institutions, including undergraduate, graduate, and first-professional students. Information is collected from institutions, student interviews, and government data files. For this study, data were analyzed for undergraduates from three administrations of the NPSAS survey: NPSAS:93, NPSAS:96, and NPSAS:2000. These surveys represent more than 16 million undergraduates who were enrolled at some time between July 1 and June 30 of the survey years and, together, provide a picture of recent patterns and trends in the awarding of institutional aid.

For NPSAS:93, the institutional weighted response rate was 88.2 percent and the overall effective response rate for student interviews was 71.4 percent;[17] for NPSAS:96, the institutional weighted response rate was 93.1 percent and the overall effective response rate for student interviews was 76.2 percent;[18] and for NPSAS:2000, the institutional response rate was 97 percent and the weighted overall student interview response rate was 65.6 percent.[19] Because the student telephone interview response rate for NPSAS:2000 was less than 70 percent in some institutional sectors, an analysis was conducted to determine if Computer Assisted Telephone Interview (CATI) estimates were significantly biased due to CATI nonresponse. Considerable information was known for CATI nonrespondents, and these data were used to analyze and

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[16]For more information on the NPSAS survey, consult the methodology reports: U.S. Department of Education, National Center for Education Statistics, *Methodology Report for the National Postsecondary Student Aid Study, 1992–93* (NCES 95–211) (Washington, DC: 1995), *National Postsecondary Student Aid Study, 1995–96 (NPSAS:96), Methodology Report* (NCES 98–073) (Washington, DC: 1998), and *National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000), Methodology Report* (NCES 2002–152) (Washington, DC: 2002). Additional information is also available at the NPSAS web site *http://nces.ed.gov/npsas*.

[17]U.S. Department of Education, National Center for Education Statistics, *Methodology Report for the National Postsecondary Student Aid Study, 1992–93*.

[18]U.S. Department of Education, National Center for Education Statistics, *National Postsecondary Student Aid Study, 1995–96 (NPSAS:96), Methodology Report*.

[19]U.S. Department of Education, National Center for Education Statistics, *National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000), Methodology Report*.

reduce the bias. The distributions of several variables using the design-based, adjusted weights for study respondents (study weights) were found to be biased before CATI nonresponse adjustments. The CATI nonresponse and poststratification procedures, however, reduced the bias for these variables, and the remaining relative bias ranged from 0 to 0.35 percent.[20]

## The Beginning Postsecondary Student Longitudinal Study

The Beginning Postsecondary Students (BPS) Longitudinal Study is composed of the students who participated in the 1995–96 National Postsecondary Student Aid Survey (NPSAS:96). The BPS sample consists of approximately 12,000 students identified in NPSAS:96 who were beginning postsecondary education for the first time in 1995–96. The First Follow-up of the BPS cohort (BPS:96/98) was conducted in 1998, approximately 3 years after these students first enrolled. Approximately 10,300 of the students who first began in 1995–96 were located and interviewed in the 1998 follow-up, for an overall weighted response rate of 79.8 percent. This response rate includes those who were nonrespondents in 1996; among the NPSAS:96 respondents, the response rate was 85.9 percent.[21] The Second Follow-up of the BPS cohort (BPS:96/2001) was conducted in 2001, 6 years after students' college entry. All respondents to the First Follow-up, as well as a subsample of nonrespondents in 1998, were eligible to be interviewed. Over 9,100 students were located and interviewed. The weighted response rate was 83.6 percent overall, but it was somewhat higher among respondents to both the 1996 and the 1998 interviews (87.4 percent).[22]

Nonresponse among cohort members causes bias in survey estimates when the outcomes of respondents and nonrespondents are shown to be different. A bias analysis was conducted on the 2001 survey results to determine if any variables were significantly biased due to nonresponse.[23] Considerable information was known from the 1996 and 1998 surveys for nonrespondents to the 2001 interviews, and nonresponse bias could be estimated using variables with this known information. Weight adjustments were applied to the BPS:96/2001 sample to reduce any bias found due to unit nonresponse. After the weight adjustments, some variables were found to reflect zero bias, and for the remaining variables, the bias did not differ significantly from zero.

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[20]For nonresponse bias analysis, see U.S. Department of Education, National Center for Education Statistics, *National Postsecondary Student Aid Study, 1999–2000 (NPSAS:2000), CATI Nonresponse Bias Analysis Report* (NCES 2002–03) (Washington, DC: 2002), available at *http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=200203*.

[21]For more information on the BPS:96/98 survey, consult U.S. Department of Education, National Center for Education Statistics, *Beginning Postsecondary Students Longitudinal Study First Follow-up 1996–98, Methodology Report* (NCES 2000–157) (Washington, DC: 2000).

[22]For more information on the BPS:1996/2001 survey, consult U.S. Department of Education, National Center for Education Statistics, *Beginning Postsecondary Students Longitudinal Study: 1996–2001 Methodology Report* (NCES 2002–171) (Washington, DC: 2002).

[23]Ibid.

The BPS:96/98 and BPS:96/2001 Data Analysis Systems include sample weights for longitudinal analysis of the sample through 1998 (B98AWT) and 2001 (B01LWT2). All of the tables and estimated in the report use longitudinal weights.

## Accuracy of Estimates

The statistics in this report are estimates derived from a sample. Two broad categories of error occur in such estimates: sampling and nonsampling errors. Sampling errors occur because observations are made only on samples of populations rather than on entire populations. Nonsampling errors occur not only in sample surveys but also in complete censuses of entire populations. Nonsampling errors can be attributed to a number of sources: inability to obtain complete information about all sample members (e.g., some students refused to participate, or students participated but answered only certain items); ambiguous definitions; differences in interpreting questions; inability or unwillingness to give correct information; mistakes in recording or coding data; and other errors of collecting, processing, sampling, and imputing missing data. In addition, some items may be subject to more variation over time.

## Adjustments for Inflation

All comparisons between 1992–93, 1995–96, and 1999–2000 were made using constant 1999 dollars based on the Consumer Price Index for All Urban Consumers (CPI-U) table provided by the U.S. Department of Labor, Bureau of Labor Statistics. The average Consumer Price Index was 140.3 in 1992 (for the 1992–93 academic year), 152.4 in 1995 (for the 1995–96 academic year), and 166.6 in 1999 (for the 1999–2000 academic year). The multiplier used to convert 1992 into 1999 dollars was 1.188, and the multiplier used to convert 1995 into 1999 dollars was 1.093. Standard errors also were adjusted for inflation in the same manner.

## Data Analysis System

The estimates presented in this report were produced using the NPSAS:93, NPSAS:96, and NPSAS:2000, as well as the BPS:98 and BPS:2001 undergraduate Data Analysis Systems (DASs). The DAS software makes it possible for users to specify and generate their own tables. With the DAS, users can replicate or expand upon the tables presented in this report. In addition to the table estimates, the DAS calculates proper standard errors[24] and weighted sample sizes for

[24]The NPSAS:2000 samples are not simple random samples, and therefore, simple random sample techniques for estimating sampling error cannot be applied to these data. The DAS takes into account the complexity of the sampling procedures and calculates standard errors appropriate for such samples. The method for computing sampling errors used by the DAS involves approximating the estimator by the linear terms of a Taylor series expansion. The procedure is typically referred to as the "Taylor series method."

these estimates. For example, table B1 contains standard errors that correspond to estimates in table 6 in the report. All standard errors can be viewed on the NCES Web Site at *http://nces.ed.gov/DAS/*. If the number of valid cases is too small to produce a reliable estimate (less than 30 cases), the DAS prints the message "low-N" instead of the estimate.

**Table B1. Standard errors for table 6: Percentage of 1995–96 beginning full-time students in 4-year institutions who received institutional grant aid, by high school academic merit, financial need, and institution selectivity**

| Academic merit index and financial need | Less selective | Very selective | Total |
|---|---|---|---|
| Total | 1.78 | 2.73 | 1.44 |
| | | Public | |
| Total | 1.74 | 3.09 | 1.50 |
| Academic merit index | | | |
| Low | 2.06 | 8.06 | 1.93 |
| Middle | 2.11 | 3.40 | 1.79 |
| High | 5.69 | 4.65 | 3.91 |
| Student financial need | | | |
| No need | 1.98 | 2.13 | 1.54 |
| Moderate (less than $6,000) | 2.07 | 3.93 | 1.90 |
| High ($6,000 or more) | 3.90 | 6.33 | 3.25 |
| | | Private not-for-profit | |
| Total | 3.04 | 3.95 | 2.47 |
| Academic merit index | | | |
| Low | 5.42 | 6.34 | 4.29 |
| Middle | 3.29 | 5.23 | 2.87 |
| High | 7.77 | 5.31 | 4.46 |
| Student financial need | | | |
| Low (less than $4,000) | 4.06 | 13.43 | 3.99 |
| Moderate ($4,000–15,500) | 4.21 | 5.06 | 3.33 |
| High (more than $15,500) | 2.48 | 4.83 | 3.88 |

SOURCE: U.S. Department of Education, National Center for Education Statistics, 1995/96 Beginning Postsecondary Students Longitudinal Study, "First Follow-up" (BPS:96/98).

In addition to tables, the DAS will also produce a correlation matrix of selected variables to be used for linear regression models. Included in the output with the correlation matrix are the design effects (DEFTs) for each variable in the matrix. Since statistical procedures generally compute regression coefficients based on simple random sample assumptions, the standard errors must be adjusted with the design effects to take into account the stratified sampling method used in the surveys.

The DAS can be accessed electronically at *http://nces.ed.gov/DAS*. For more information about the NPSAS and BPS Data Analysis System, contact:

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## Statistical Procedures

### *Differences Between Means*

The descriptive comparisons were tested in this report using Student's *t* statistic. Differences between estimates are tested against the probability of a Type I error,[25] or significance level. The significance levels were determined by calculating the Student's *t* values for the differences between each pair of means or proportions and comparing these with published tables of significance levels for two-tailed hypothesis testing ($p \leq .05$).

Student's *t* values may be computed to test the difference between estimates with the following formula:

$$t = \frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2}} \quad (1)$$

where $E_1$ and $E_2$ are the estimates to be compared and $se_1$ and $se_2$ are their corresponding standard errors. This formula is valid only for independent estimates. When estimates are not independent, a covariance term must be added to the formula:

$$\frac{E_1 - E_2}{\sqrt{se_1^2 + se_2^2 - 2(r)se_1\ se_2}} \quad (2)$$

where *r* is the correlation between the two variables.[26] The denominator in this formula will be at its maximum when the two estimates are perfectly negatively correlated, that is, when $r = -1$.

[25] A Type I error occurs when one concludes that a difference observed in a sample reflects a true difference in the population from which the sample was drawn, when no such difference is present.

[26] U.S. Department of Education, National Center for Education Statistics, *A Note from the Chief Statistician*, no. 2, 1993.

This means that a conservative dependent test may be conducted by using –1 for the correlation in this formula as follows:

$$t = \frac{E_1 - E_2}{\sqrt{(se_1)^2 + (se_2)^2 + 2se_1 se_2}}. \quad (3)$$

The estimates and standard errors are obtained from the DAS. If the comparison is between the mean of a subgroup and the mean of the total group, the following formula is used:

$$\frac{E_{sub} - E_{tot}}{\sqrt{se_{sub}^2 + se_{tot}^2 - 2p\, se_{sub}^2}} \quad (4)$$

where $p$ is the proportion of the total group contained in the subgroup.[27] The estimates, standard errors, and correlations can all be obtained from the DAS.

There are hazards in reporting statistical tests for each comparison. First, comparisons based on large $t$ statistics may appear to merit special attention. This can be misleading since the magnitude of the $t$ statistic is related not only to the observed differences in means or percentages but also to the number of respondents in the specific categories used for comparison. Hence, a small difference compared across a large number of respondents would produce a large $t$ statistic.

A second hazard in reporting statistical tests is the possibility that one can report a "false positive" or Type I error. In the case of a $t$ statistic, this false positive would result when a difference measured with a particular sample showed a statistically significant difference when there is no difference in the underlying population. Statistical tests are designed to control this type of error, denoted by alpha. The alpha level of .05 selected for findings in this report indicates that a difference of a certain magnitude or larger would be produced no more than one time out of twenty when there was no actual difference in the quantities in the underlying population. When we test hypotheses that show $t$ values at the .05 level or smaller, we treat this finding as rejecting the null hypothesis that there is no difference between the two quantities. However, there are other cases when exercising additional caution is warranted. When there are significant results not indicated by any hypothesis being tested or when we test a large number of comparisons in a table, Type I errors cannot be ignored. For example, when making paired comparisons among different levels of income, the probability of a Type I error for these comparisons taken as a group is larger than the probability for a single comparison.

[27] Ibid.

When the either of the two situations described in the previous paragraph was encountered in this report, comparisons were made when $p \leq .05/k$ for a particular pairwise comparison, where that comparison was one of $k$ tests within a family. This guarantees both that the individual comparison would have $p \leq .05$ and that for $k$ comparisons within a family of possible comparisons, the significance level for all the comparisons will sum to $p \leq .05$.[28]

For example, in a comparison of the percentages of males and females who attend public institutions, only one comparison is possible (males vs. females). In this family, $k$=1, and the comparison can be evaluated without adjusting the significance level. When respondents are divided into three income groups and all possible comparisons are made, then $k$=3 and the significance level of each test must be $p \leq .05/3$, or $p \leq .017$. The formula for calculating family size ($k$) is as follows:

$$k = \frac{j(j-1)}{2} \tag{5}$$

where $j$ is the number of categories for the variable being tested. There were a few instances when apparent differences between income or need levels were significant when $k$=1, but not when $k$=3. These comparisons are stated in the text and the significance level is footnoted.

### *Linear Trends*

While many descriptive comparisons in this report were tested using Student's $t$ statistic, some comparisons among categories of an ordered variable with three or more levels involved a test for a linear trend across all categories (in particular for income and need categories), rather than a series of tests between pairs of categories. In this report, when differences among percentages were examined relative to a variable with ordered categories, Analysis of Variance (ANOVA) was used to test for a linear relationship between the two variables. To do this, ANOVA models included orthogonal linear contrasts corresponding to successive levels of the independent variable. The squares of the Taylorized standard errors (that is, standard errors that were calculated by the Taylor series method), the variance between the means, and the unweighted sample sizes were used to partition total sum of squares into within- and between-group sums of squares. These were used to create mean squares for the within- and between-group variance components and their corresponding F statistics, which were then compared with

[28]The standard that $p \leq .05/k$ for each comparison is more stringent than the criterion that the significance level of the comparisons should sum to $p \leq .05$. For tables showing the $t$ statistic required to ensure that $p \leq .05/k$ for a particular family size and degrees of freedom, see Olive Jean Dunn, "Multiple Comparisons Among Means," *Journal of the American Statistical Association* 56 (1961): 52–64.

published values of F for a significance level of .05.[29] Significant values of both the overall F and the F associated with the linear contrast term were required as evidence of a linear relationship between the two variables. Means and Taylorized standard errors were calculated by the DAS. Unweighted sample sizes are not available from the DAS and were provided by NCES.

### *Bivariate Correlations*

The strength of the relationships between pairs of variables can be described using a scale of magnitudes as described by Cohen (1988),[30] who adopted the notion of a scale of small, moderate, and large sized relationships, which allows for a qualitative interpretation of the strength of a relationship through the concept of effect size. Cohen suggested that for a scale of the proportion of variance accounted for (the square of the correlation coefficient, $r^2$), one might use a value of 0.01 to signify a small effect size, 0.09 for moderate, and 0.25 for large. Some latitude is appropriate in determining the scale of effect sizes within the context of the analysis. In the analysis reported here, the outcome variable used in the multivariate analysis (see discussion of methods below) was dichotomous (i.e., whether a student was retained at the awarding institution). While the overall results of linear probability models (such as the one used in this analysis) are comparable to those produced by logit and probit models when the probability of the outcome is sufficiently large (as it is here), the $r^2$s are often substantially lower.[31] Taking this into consideration, the magnitudes reported here were based on a scale in which the effect is small if $r^2$ is less than 0.04, moderate if $r^2$ is at least 0.04 but less than 0.12, and large if $r^2$ is 0.12 or greater. In this analysis, effect sizes for both public and private not-for-profit institutions ranged from .023 to .041, signifying small to moderate effects.

### *Multivariate Analysis*

Many of the independent variables included in the analyses in this report are related, and to some extent, the pattern of differences found in the descriptive analyses reflects this covariation. For example, when examining the retention rates of students by receipt of institutional grant aid, it is possible that some of the observed relationship is due to differences among other factors related to institutional grant aid or tuition, such as institution selectivity, high school academic merit, financial need, and so on. However, if nested tables were used to isolate all the influence of these other factors, cell sizes would become too small to identify the significant differences in

[29]More information about ANOVA and significance testing using the F statistic can be found in any standard textbook on statistical methods in the social and behavioral sciences.

[30]Jacob Cohen, *Statistical Power Analysis for the Behavioral Sciences*, 2nd Edition (Hillsdale, NJ: Lawrence Erlbaum Associates, 1988).

[31]See table 8.5 on page 338 for comparisons of $r^2$s in G.S. Maddala, *Introduction to Econometrics* (New York: Macmillan Publishing Company, 1992).

patterns. When the sample size becomes too small to support controls for another level of variation, other methods must be used to take such variation into account.

The method used in this report is an approach sometimes referred to as communality analysis. For the analysis of 6-year retention rates, multiple linear regression was used to adjust for the covariation among a list of control variables.[32] The independent or control variables were selected based solely on the descriptive analysis rather than on a theoretical model. These descriptive regression models were not reduced. The least squares regression coefficients displayed in the regression tables are expressed as percentages. Significant coefficients represent the observed differences that remain between the analysis group (such as those receiving certain amounts of institutional aid) and the comparison group (those receiving no institutional aid) after controlling for the relationships of all the selected independent variables. For example, in table 10a, the least squares coefficient for those who received enough institutional aid to cover 50 percent or more of tuition is 14.97. This means that compared to those who received no institutional aid, about 15 percent more of the aid recipients would be expected to maintain their enrollment or attain a degree at the awarding institution after controlling for the relationships with all the other independent variables.

It is possible to produce a regression model using the DAS, because one of the DAS output options is a correlation matrix, computed using pairwise missing values. In regression analysis, there are several common approaches to the problem of missing data. The two simplest approaches are pairwise deletion of missing data and listwise deletion of missing data. In pairwise deletion, each correlation is calculated using all of the cases for the two relevant variables. For example, suppose you have a regression analysis that uses variables X1, X2, and X3. The regression is based on the correlation matrix between X1, X2, and X3. In pairwise deletion, the correlation between X1 and X2 is based on the nonmissing cases for X1 and X2. Cases missing on either X1 or X2 would be excluded from the calculation of the correlation. In listwise deletion, the correlation between X1 and X2 would be based on the nonmissing values for X1, X2, and X3. That is, all of the cases with missing data on any of the three variables would be excluded from the analysis.

The correlation matrix can be used by most statistical software packages as the input data for least squares regression. That is the approach used for this report, with an additional adjustment to incorporate the complex sample design into the statistical significance tests of the parameter estimates (described below).

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[32]For more information about least squares regression, see Michael S. Lewis-Beck, *Applied Regression: An Introduction*, Vol. 22 (Beverly Hills, CA: Sage Publications, Inc., 1980); William D. Berry and Stanley Feldman, *Multiple Regression in Practice*, Vol. 50 (Beverly Hills, CA: Sage Publications, Inc., 1987).

The actual model used in the analysis consisted of a dichotomous dependent variable that denoted whether a student had attained a degree from or was still enrolled at the awarding institution 6 years after initial enrollment, and a set of independent dummy variables. Independent variables that were significantly associated with the outcome in the tabular analysis were included in the model. In addition, student demographic variables (gender, race/ethnicity, parents' education) were also included. The final set of independent variables included: the amount of institutional grant aid as a percent of tuition (each level of aid vs. no institutional aid), institution selectivity (very selective vs. less selective), students' high school academic merit (high and middle merit vs. low merit) and financial need (high and moderate vs. low), gender, race/ethnicity, and parents' highest level of education. These variables explained about 9 percent of the variance in public institutions and 7 percent in private institutions.

Although the DAS simplifies the process of making linear regression models, it also limits the range of models. The procedure used here relies on a least squares regression model, which is sometimes sufficient for binary outcomes (such as the outcome studied here). However, when the proportion of the sample participating in the outcome is very low or very high, logit or probit models are preferred.[33]

Most statistical software packages assume simple random sampling when computing standard errors of parameter estimates. Because of the complex sampling design used for the survey, this assumption is incorrect. A better approximation of their standard errors is to multiply each standard error by the design effect associated with the dependent variable (DEFT),[34] where the DEFT is the ratio of the true standard error to the standard error computed under the assumption of simple random sampling. It is calculated by the DAS and produced with the correlation matrix output.

[33]See John H. Aldrich and Forrest D. Nelson, "Linear Probability, Logit and Probit Models" (*Quantitative Applications in Social Sciences*, Vol. 45) (Beverly Hills, CA: Sage, 1984). Analysts who wish to estimate other types of models can apply for a restricted data license from NCES.

[34]The adjustment procedure and its limitations are described in C.J. Skinner, D. Holt, and T.M.F. Smith, eds., *Analysis of Complex Surveys* (New York: John Wiley & Sons, 1989).

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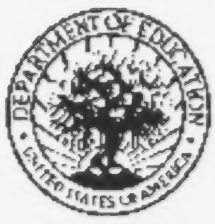

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